AMERICAN ARTISAN

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NTRACTING • AIR CONDITIONING

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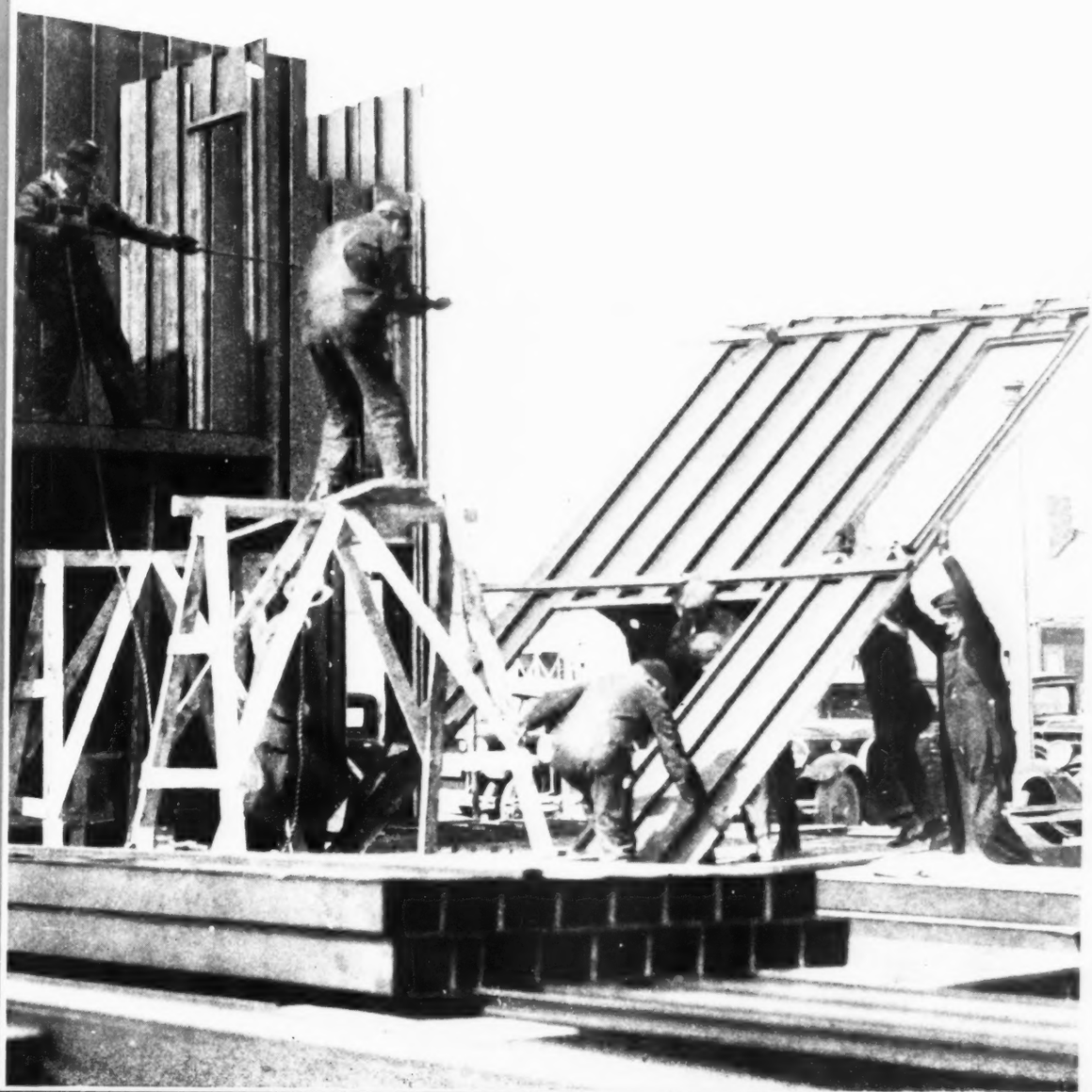

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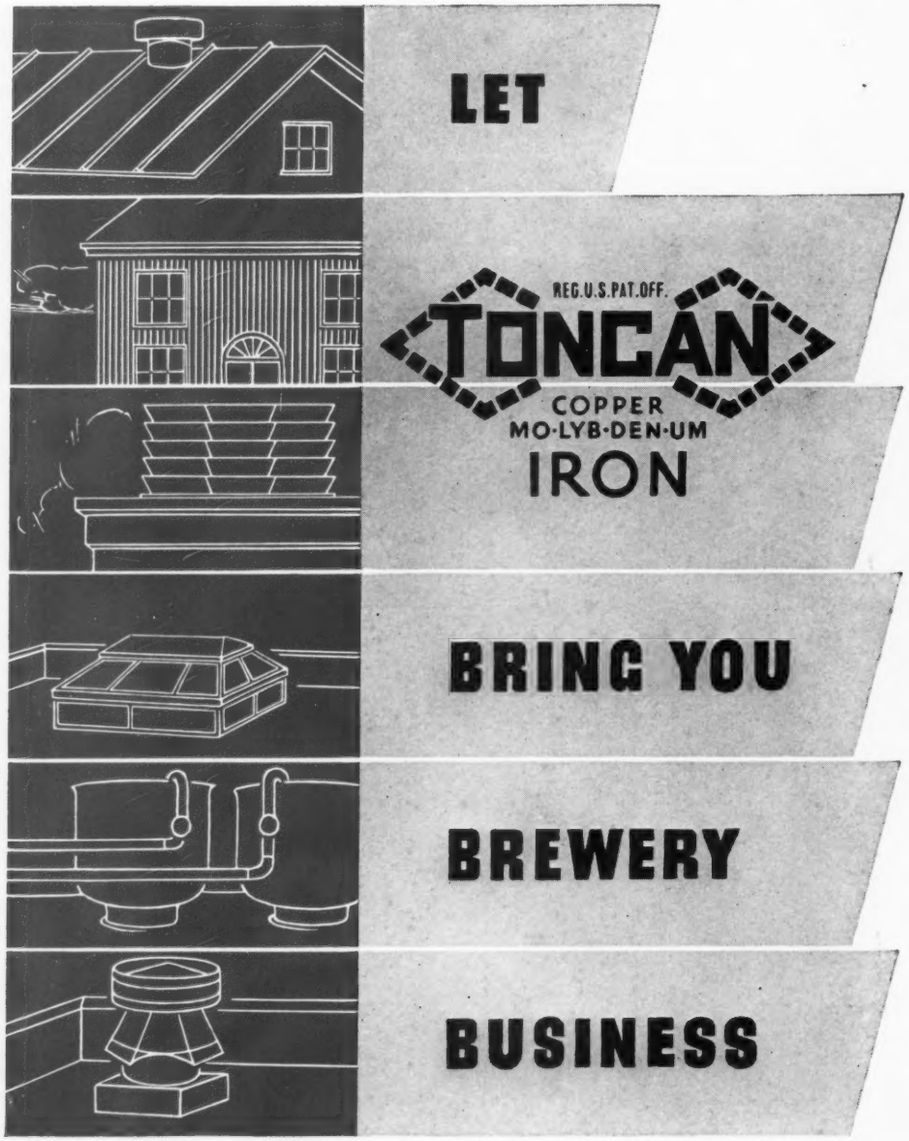

It is estimated that close to $400,000,000 will be spent in the modernization of old brewing plants and the construction of new ones. This represents a worth-while field of activity for sheet metal contractors wherever the new brew is legal.

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Roofing

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FURNACES and SHEET METALS AND Warm-Air Heating

Vol. 102, No. 8 August, 1933 Founded 1880

Published Monthly by
Engineering Publications, Inc.
1900 Prairie Avenue, CHICAGO

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110 East 42nd Street
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Chamber of Commerce Bldg.

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Engineering Publications, Inc.

Member of Audit Bureau of Circulations

Yearly Subscription Price — Anywhere in the world, $2.00; Single Copies, $.25. Back numbers $.50. Entered as second-class matter, July 29, 1932, at the Post Office at Chicago, Illinois under the act of March 3, 1879.

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More than 7,000 copies of this issue are being distributed.

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It is easy to operate; takes current from the ordinary 220 or 440-volt electric power outlet; uses less than 15 cents worth of electric power an hour; and produces high-quality welds.

In completely solving the problems of sheet-metal fabrication this new welder can be your most effective weapon for winning new business.

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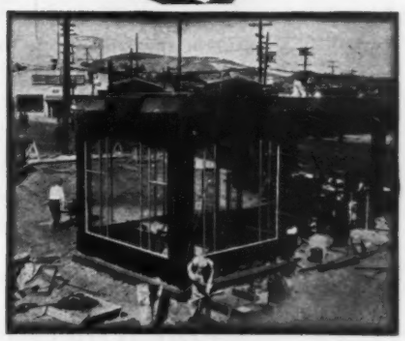
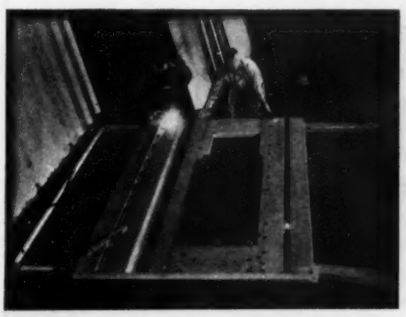
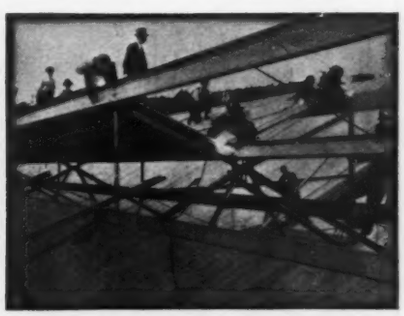


● Service Station Erection—*One of a large number of service stations completely shop-fabricated by a California contractor with FlexArc Welders. Frame work is angle iron, the covering 16-gauge sheet steel.*



● Shop Fabrication—*Because of its easy portability, many contractors use the FlexArc Welder in the shop for the fabrication of sections, then haul the same machine to the scene of erection.*

● Steel-house Construction—*The first frameless steel house, erected at Solon, Ohio, was completely arc-welded. A FlexArc Welder supplied the current for shop and field fabrication.*



● General Contracting Work—*The FlexArc A-C Welder enables you to go after these jobs: ventilating and furnace ducts, air conditioning installations, roofing, gutters, cornice work, signs, ornamental work.*

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A practical expression of the Anglo-Saxon genius for the workable compromise

THE American Business Paper serves two needs which might, at first glance, seem to be diametrically opposed. It is at once a market place where the manufacturer may sell his wares, and an educational institution in the best sense of the word, independent and authoritative. Our modern liberals find it easy to be cynical, without in the least understanding that the common sense which does not strive for impossible ideals may yet serve honestly the practical needs of every-day life. The business paper is the motive force behind our swift, wide distribution of new products on the one hand, and a better informed distributing group than will be found anywhere in the world. A compromise it may be—but it is one which has demonstrably served industry to industry's satisfaction.

One aspect of the Business Paper which explains the mutual relationship between its growth and the rapid growth of industry in America

THE technical product requires local technical skill for its sale, installation and servicing in the case of consumer products, and for its installation and operation in the case of capital products. In his Business Paper, the local executive, either dealer or technician, receives regularly the information representing the latest advances in technique and marketing. This information covers, in part, the slow improvement that is always taking place. In addition, the Business Paper brings to him immediately those occasional major advancements which sometimes alter conditions in an industry radically. The Business Paper takes up the "drag" that would otherwise intervene between such developments and the knowledge of them on the part of the men at the far end of the distributing chain.

What men may have spent years of arduous research to develop, once it has been put into production, is available to men in every corner of the country, through the American Business Paper, almost before the ink is dry on the laboratory report. Which is why America's business men are always abreast of the latest developments in their industries.

FOR practically all steel applications out-of-doors, and for numerous indoor uses, Inland Copper-Alloy steel deserves preference. For it is the answer wherever there is moist air. Unbiased tests prove that copper-bearing steel resists corrosion longer than ordinary steel or iron.

And this extra sales and service value costs but a little more. The price of Inland Copper-Alloy is only slightly greater than the price of ordinary grades. And less than other corrosion-resisting materials—usually far less.

Start getting extra value with Inland Copper-Alloy Steel sheets, bars. shapes, structurals, and other rolled steel products. INLAND STEEL COMPANY, 38 So. Dearborn St., Chicago. Ill.

PROOF

Iron and steel sheets have been ranked according to rust and corrosion resistance under atmospheric conditions by the American Society for Testing Materials, ranking based on tests at Fort Sheridan, Annapolis and Pittsburgh. Copper-bearing steel sheets lead the list.

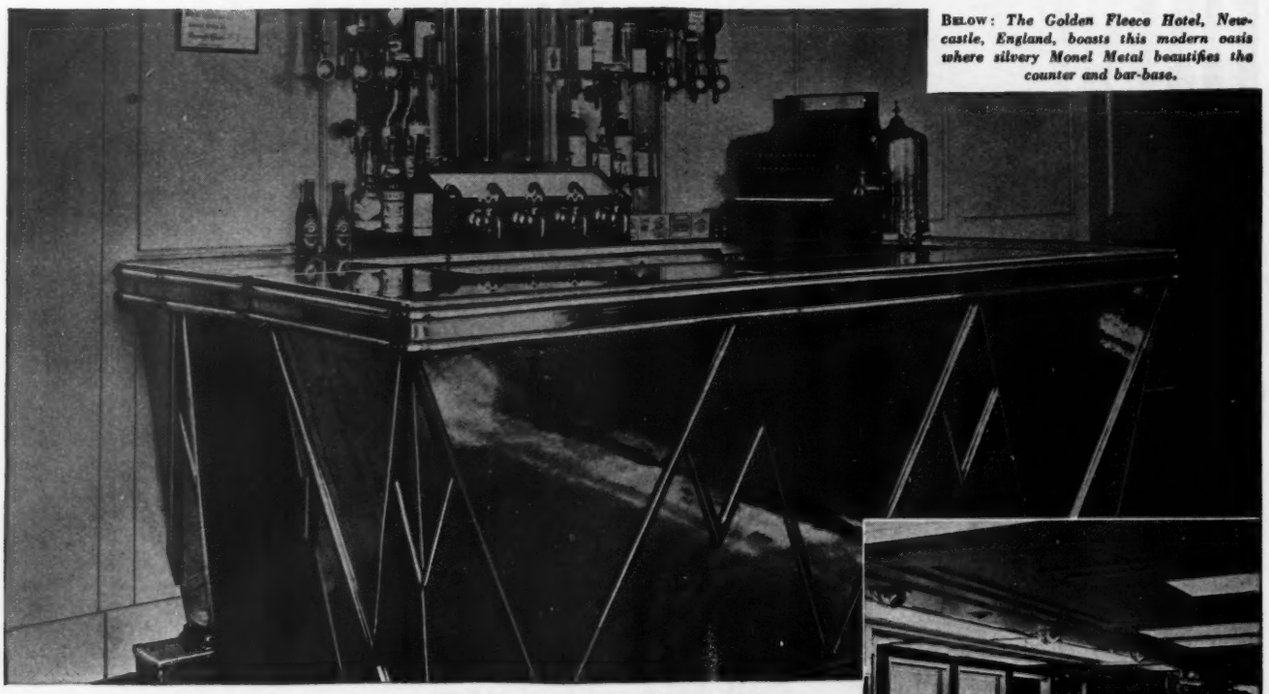
INLAND STEEL

ABLE SERVANT OF THE CENTRAL WEST

Sheets Strip Plates Rails Track Accessories
Bands Structurals Piling Bars Rivets Billets

"Behind the scenes" in the tap room of the Hotel York, Vancouver, B. C., showing sink, drainboards and other working surfaces of lustrous, rust-proof Monel Metal.

What the WELL DRESSED BAR WILL WEAR . . . . *and HOW!*



BELOW: *The Golden Fleece Hotel, Newcastle, England, boasts this modern oasis where silvery Monel Metal beautifies the counter and bar-base.*

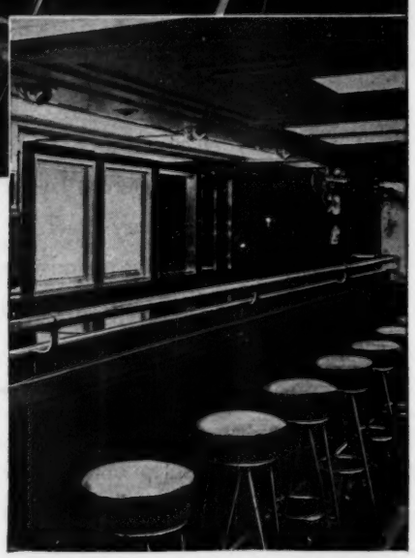
Plan for future profits with inviting MONEL METAL!

This "Zahm" Counter Pressure Tapping Apparatus shows how perfectly Monel Metal combines beauty with utility in modern bar equipment.

● Pictures prove that the bar is coming in for its share of the "New Deal", too! They show how lustrous Monel Metal is taking the place of less attractive, less durable materials in up-to-date bar equipment. Counters, sinks, rails, drains and other metal parts all gleam with the permanent, refreshing beauty of this silvery Nickel alloy.

Rust-proof, chip-proof, corrosion-resisting, easy-to-clean, Monel Metal is being specified for many of the new bars being put in today.

Why not get some of these jobs for yourself?



"The Bacchante" is the first-class bar aboard the new super-liner "Monarch of Bermuda." Monel Metal is used for counter front, glass framework and stool legs.

MONEL METAL

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street New York, N. Y.

Monel Metal is a registered trade-mark applied to an alloy containing approximately two-thirds Nickel and one-third copper. Monel Metal is mined, smelted, refined, rolled and marketed solely by International Nickel.

VOLUME 102 AMERICAN ARTISAN NUMBER 8

WARM AIR HEATING • SHEET METAL CONTRACTING • AIR CONDITIONING

Information on the Industrial Recovery Act

EVERYONE in the furnace and sheet metal industries is asking—"How and where do I function in the preparation and observance of my industry's code of fair practices asked for under the National Industrial Recovery Act, which is now a law?"

We have received advice from Washington to the effect that—

"There is being organized in the Construction League of the United States a Code Committee which is formulating a code for the industry. Such a code will probably contain general clauses in the spirit of the Recovery Act to which all branches of the industry can subscribe and also the individual codes of each branch as produced by the national organizations.

"The National Industrial Recovery Act permits industry to organize itself and agree upon its Code of Fair Practice under the specifications of the Act. In order that self-government be assured in the industry in adhering to its accepted code, it is clear that it ought to be organized nationally and coordinated, where possible, with similar or dependent activities.

"Producers of materials, who are not in the business of installing the materials are, at the present time, expected to submit separate codes or to combine in groups which will subscribe to a single code. It is clearly advisable to have associations in similar enterprises combine as far as possible and submit codes prepared by National Associations truly representative of the industries throughout the country. If local branches of similar industries each submit codes, it will be a never-ending labor to correlate them, hold the necessary hearings and carrying out the required procedure for adoption.

"Those industries which naturally fall under the head of branches of the construction industry, other than producers of material who do not install the materials on the work, can aid materially in the preparation of a code for the construction industry, as a whole, by cooperating through their National Associations with the activities of the Committee.

"The headquarter's address of the Code Committee of the Construction League of the United States is 1741 New York Avenue, Washington, D. C."

It is evident that the government desires that so far as possible codes should be submitted by national organizations and in as large a group as possible.

According to the present plan, the sheet metal, ventilating, warm air heating, air conditioning and roofing industries will be subdivisions of the general construction industry and will subscribe to the provisions of a basic code which will also guide the general contractor, plumber, electrician and the dozens of other crafts which make up the construction industry.

In our opinion, the basic code may adopt minimum scales of labor, maximum hours of work and specify unfair practices leaving to each particular branch of the construction industry as a whole the elimination of those unfair practices peculiar to it.

So far as hours of work per week are concerned, the construction industry must take cognizance of the effects of seasons and the weather and it would seem that a working period of so many hours of work per month or longer meets our needs better than hours per week. The Associated General Contractors and the American Road Builders' Association have suggested in their codes that a working period of 130 to 150 hours per month is best suited to our dependence upon weather and peak working seasons.

Wage rates per hour must be decided according to size of communities and living costs and included in the code submitted for our industries as a whole.

National Industrial Recovery Act

Section 7 of the National Industrial Recovery Act deals with the questions of wages, working hours and unfair practices. It is this section which concerns directly every contractor and association. This section is reprinted here for reference.

Sec. 7. (a) Every code of fair competition, agreement, and license approved, prescribed, or issued under this title shall contain the following conditions: (1) That employees shall have the right to organize and bargain collectively, through representatives of their own choosing, and shall be free from the interference, restraint, or coercion of employers of labor, or their agents, in the designation of such representatives or in self-organization or in other concerted activities for the purpose of collective bargaining or other mutual aid or protection; (2) that no employee and no one seeking employment shall be required as a condition of employment to join any company union or to refrain from joining, organizing, or assisting a labor organization of his own choosing; and (3) that employers shall comply with the maximum hours of labor, minimum rates of pay, and other conditions of employment, approved or prescribed by the President.

(b) The President shall, so far as practicable, afford every opportunity to employers and employees in any trade or industry or subdivision thereof with respect to which the conditions referred to in clauses (1) and (2) of subsection (a) prevail, to establish by mutual agreement, the standards as to the maximum hours of labor, minimum rates of pay, and such other conditions of employment as may be necessary in such trade or industry or subdivision thereof to effectuate the policy of this title; and the standards established in such agreements, when approved by the President, shall have the same effect as a code of fair competition, approved by the President under subsection (a) of section 3.

(c) Where no such mutual agreement has been approved by the President he may investigate the labor practices, policies, wages, hours of labor, and conditions of employment in such trade or industry or subdivision thereof; and upon the basis of such investigations, and after such hearings as the President finds advisable, he is authorized to prescribe a limited code of fair competition fixing such maximum hours of labor, minimum rates of pay, and other conditions of employment in the trade or industry or subdivision thereof investigated as he finds to be necessary to effectuate the policy of this title, which shall have the same effect as a code of fair competition approved by the President under subsection (a) of section 3. The President may differentiate according to experience and skill of the employees affected and according to the locality of employment; but no attempt shall be made to introduce any classification according to the nature of the work involved which might tend to set a maximum as well as a minimum wage.

The Associated General Contractor's Code

One of the codes pertaining to our field and already submitted for approval was prepared by the Associated General Contractors. The provisions of this code which affect our contractors are here published.

The Associated General Contractors of America, a national trade association representative of general contractors throughout the United States for more than fourteen years last past, pursuant to the purpose of the general contractors of the construction industry to cooperate with the President of the United States in effectuating the policy declared in Title 1 of the National Industrial Recovery Act, does hereby recommend and submit for approval pursuant to Section 3 of said title the following Code of Fair Competition and plan for its administration for all construction work in so far as it pertains to general contractors:

Article I

[*The code here states the policy of the association in regard to competition.—The Editors.*]

Article II—Declaration of Policy

[*The code here outlines the general policy of the code.—The Editors.*]

Article III—Definition of "Contractor"

When used in this code, the term "general contractor" is any person, partnership, company, association, corporation or agency which contracts to supervise, coordinate and/or execute the work of constructing an improvement substantially in its entirety, as is embraced in plans and/or specifications. Any person, firm, partnership, agency, company, association or corporation undertaking to direct, supervise, coordinate and/or execute construction work whether by formal contract or otherwise in excess of $1,000 in the aggregate shall be subject to compliance with these articles and code as fully and completely as shall any person, firm, partnership, agency, company, association or corporation known or designated as a "general contractor" in the construction industry.

Article IV—Labor Relations

[*Section 1 deals with right of employees to bargain and be granted freedom of action.—The Editors.*]

Sectin 2. Minimum Wages—(a) A general contractor shall pay wages not less than the minimum rates which are established regionally or locally by mutual agreements between truly representative groups of employers and employees, and approved by the President, as provided by Section 7 (b) of the National Industrial Recovery Act. Where such rates are not so established, the minimum rates of wages determined in each of the several States under authority of Section 204 (c) of Title II of the National Industrial Recovery Act shall be used as the minimum rates for all kinds of construction work.

(b) A general contractor shall require subcontractors and other agencies requiring the services of laborers or mechanics on the site of the work to pay not less than the established minimum rates of wages.

(c) A general contractor shall not resort to the use of what is known to the trade as "piece work" or similar contractual relationship in his employment of labor, when tending to defeat the spirit and purpose of Section 7A-3 of Title I of the National Industrial Recovery Act.

Section 3. Minimum Hours—

(a) A general contractor shall not

permit nor require any individual directly employed on any construction project to work more than 150 hours in any one month, so far as practicable and feasible; *except* those in executive administrative and supervisory positions, and *except* as a lesser number of hours is required by Title II of the National Industrial Recovery Act relating to public works and construction projects thereunder.

(b) A general contractor shall require all subcontractors and other agencies requiring the services of laborers or mechanics on the site of the work to observe strictly the maximum hours provisions established herein. Nothing herein shall be construed as preventing voluntary agreements establishing a lesser maximum number of hours as provided in the National Industrial Recovery Act.

[*Section 4 covers labor welfare.—The Editors.*]

Section 5. Payment of Wages—A general contractor shall make payment of all wages as due in lawful currency of the United States, or its equivalent in the form of a bankable check. The contractor or his agents shall accept no rebates, directly or indirectly, on such wages, nor give anything of value or extend favors to any person for the purpose of influencing rates of wages or the working conditions of his employees.

Article V—Subcontractors

Section 1. Payments — A general contractor shall pay all subcontractors, material vendors and others not less than their proportionate amount of partial payments made by the owner to the general contractor during the progress of the work, and they shall receive final payment of the unpaid balance not later than ten days after the general contractor has received final payment from the owner, except where earlier payment and/or in greater amounts are mutually agreed upon.

Section 2. Prohibited Rebates, &c. —A general contractor shall not give or accept rebates, refunds, allowances, unearned discounts or special services to or from subcontractors, material vendors or others which are not extended under like terms and conditions to other purchasers of material or services of equal credit rating.

Section 3. Financing—A general contractor shall not permit subcontractor or material vendors on a specific contract to finance or guarantee his accounts.

Section 4. Bids Confidential — A general contractor shall not convey to any subcontractor or material vendor any substantial information prior to the award of the particular subcontract relating to the bid of any other subcontractor or material vendor who has made a bid to him or to any other general contractor, nor shall he mislead or deceive any subcontractor or material vendor as to the amounts and condition of other bids for the purpose of obtaining a lower bid.

Section 5. General Requirements—A general contractor, in his relations with subcontractors, material vendors and others shall require such parties to adhere to the principles enunciated by this code of fair competition.

Section 6. Waiver of Legal Rights —A general contractor, in his contractual relations with other parties, shall not waive any rights affecting another party of interest without first fully informing such other party as to such action and receiving his consent in writing.

Section 7. Plans and Specifications—A general contractor shall not be held responsible or penalized for deficiencies in or omissions from the plans and/or specifications prepared by others and upon which the contract is based.

Article VI—General Contractors

[*Sections 1, 2, 3, 4a, define a contractor and establish his financial and credit standing.—The Editors.*]

(b) Funds received by a general contractor for construction work shall be accepted and applied first for the purpose of paying proper costs of making such improvement, including amounts due to employees, material men, subcontractors and others. This shall not be construed to require a general contractor to keep in separate bank accounts or deposits the funds received under separate contracts, provided that books of account shall clearly show the allocation to each and every contract of the funds deposited in his general or special bank account or accounts.

Section 5. Contractual Agreements —The following bases of contractual agreements are recognized as fair trade practices, guaranteed price, cost of the work plus a fee, unit price, lump sum and other contractual methods not inimical to the public interest, providing that the regulations proposed by this code of fair competition are met.

Section 6. Submitting Bids—A general contractor, in submitting bids for the construction or improvement of either public or private works, shall be governed by the following regulations necessary to insure fair competition, since it is essential that whenever contracts are to be let by competitive bidding, terms of the competition shall be such as to insure parity of standing to all bidders:

(a) All bids shall be in writing signed by the bidder.

(b) A general contractor shall not take advantage in his bid of any special privileges, favors or understandings had with him by persons in control of the award. This, however, shall not prevent any such competitor, even though not the lowest bidder, from taking such contract, providing the award is made at his original competitive bid price, nor shall it prevent any contractor from accepting the award of such contract at any price where no competitive bids are taken.

(c) A general contractor shall not revise his bid after bids have been opened in order to improve his position with the owner, except he be the low bidder. Bona fide errors discovered after the opening of bids may be grounds for withdrawal of bid. He shall not encourage or induce the owner or his agent to reject bids and readvertise in order that he may revise his original offer, nor shall any general contractor bid upon a construction project upon which bids have previously been invited, received and opened at any time within ninety days from the date of the previous opening of bids next thereafter, except there be substantial changes of the plans and specifications.

(d) A general contractor shall not knowingly submit a bid nor accept a contract which does not include all direct and indirect costs and include a reasonable amount for profit and he shall maintain and keep on file his original estimates supporting his bid or contract.

(e) A general contractor shall not be required to accept the award of a contract after fifteen (15) days after the date of opening of bids.

(f) To establish parity in bidding as to wages, prior to establishment of wages rates according to Section 7 (b) of the act there should be established by competent authority rates on which all bidders shall base their bids (but not less than those set under Section 204 (c) of Title II of the act and set forth in Article IV, Section 2, herein) and which shall be effective under the contract until other rates have been established as provided by Section 7 (b) of the act, when they shall become effective, after which a proper adjustment of the contract price as to wages shall be made between the owner and contractor.

Section 8. Unfair Practices—A general contractor shall not engage in the unfair practice known to the industry as "bid peddling" or any similar unfair practice. He shall not knowingly aid or engage in an unfair trade practice, whether or not specifically described in this code, and shall refuse to deal with any person or persons who have not complied with the code of fair competition herein defined.

Automatic Controls

This article begins discussion of a control hookup using three instruments—a room thermostat, fan control and a limit control. As we point out, this system is easy to install and wire, but the selection of the proper settings for the fan and limit control are the real problems. Most contractors have used this hookup. We shall be glad to hear what settings you use; also what settings you have discarded and why. Feel free to make this series a roundtable for your problems.

SO far in this series we have discussed a very simple control system using a room thermostat and a bonnet fan control. As we said, the chief drawback to this system is over-run of room temperature. Attempts to utilize the simplicity of this system and eliminate as far as possible room temperature over-run have resulted largely in a control system wherein a second bonnet control is placed in series with the room thermostat. The function of this second bonnet control is to act as a limit control and check the fire at some temperature ahead of the room thermostat's operation.

The result is that the draft is closed and the check is opened before the room thermostat is satisfied. Therefore, when the room thermostat is satisfied the fire has already begun to die down and the temperature in the bonnet is dropping toward the "fan off" setting of the fan control. This means that the fan runs only a short time after the room thermostat is satisfied, naturally decreasing the amount of warm air which is blown into the house even though it is not needed.

The Second Hookup

In general, this system is easy to install and wire and does not require complicated instruments. Manufacturers have recognized this system and have introduced one bonnet control in which is incorporated a fan switch and limit switch ready for wiring.

The principal difficulty of this system, most contractors will recognize, is not the instruments, or the wiring, but the selection of the settings used for the fan and limit controls. In order to get a clear picture of this problem let us consider for a minute just why we select certain settings for these instruments.

The room thermostat requires little discussion. We select an instrument which is sensitive and readily set by the home owner and of course we try to pick out an instrument which will stand up under customer habits and usage without getting out of order or requiring service.

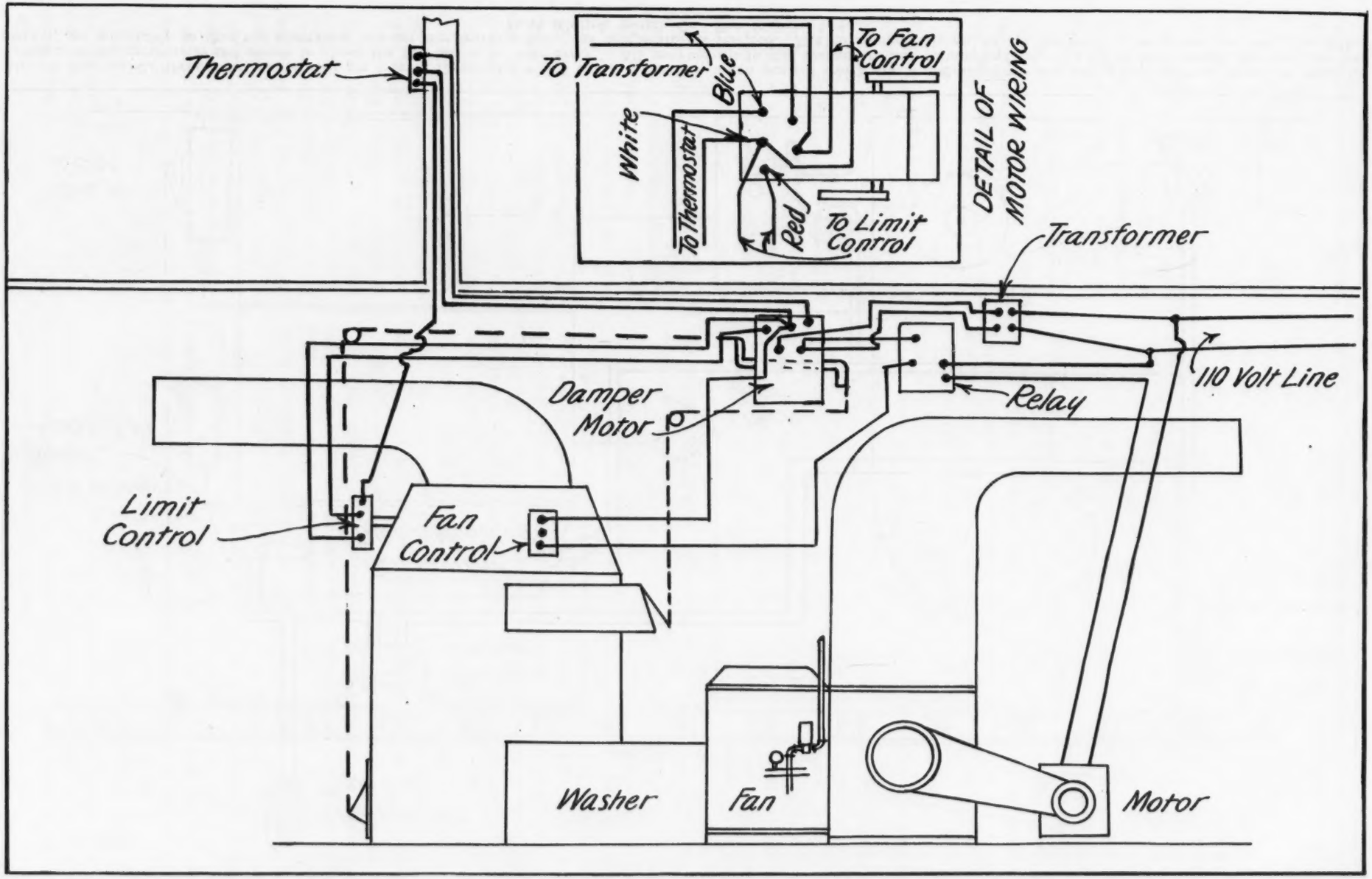
The settings chosen for the fan control should be selected with certain principles of operation and design in mind.

First, the setting at which the fan starts should usually equal or exceed the designed register temperature of the job. Some contractors have tried the interesting experiment of setting both the fan "on" and "off" settings below the designed register air temperature. In other words the fan can start just as soon as the air temperature rises above the temperature where air may feel chilly. Usually "chill" air is air of a temperature of 90 to 100 degrees and in a system of this kind the fan might start at 100 to 110 degrees.

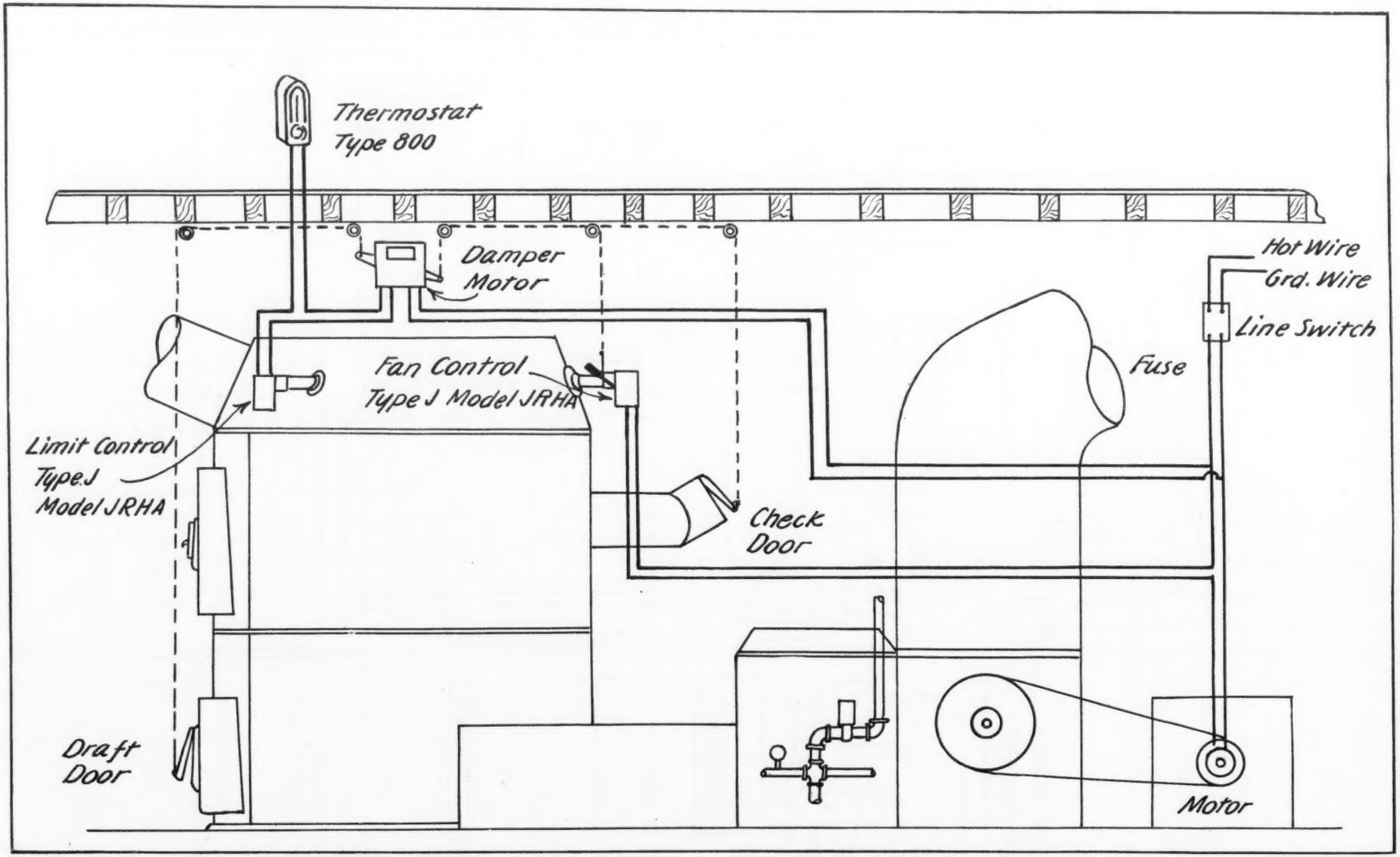
In this experiment it is assumed that the designed register air temperature is for extreme conditions and that only occasionally is air of this temperature required. Low fan settings, then, mean the system begins delivery quickly and may satisfy the room thermostat without ever delivering air of the designed register temperature. This experiment is worth study especially in mild winters, climate or weather.

This idea leads us into a whole field of speculation covering the balance between fan capacity and furnace heat delivery. For instance, even though our fan starts at 150 degrees the furnace may generate heat much faster than the fan exhausts the bonnet air and the bonnet temperature continues to rise. Or, conversely, the fan may be so large that the furnace can't deliver air of the temperature of the high setting for any sustained period. We will discuss this point in the next issue in connection with remarks on the setting of the limit control. There is, however, more to this than the mere setting of the high point equal to the register temperature. When we designed the system we selected a register temperature to work to. Perhaps we used this same temperature throughout the job regardless of the distance from the furnace to each register. If we did this we were counting on the fan control to supply air of this minimum temperature.

Perhaps we used lower register temperatures for some registers than for others because we knew that the length of a duct pretty well governs the heat loss and that the registers farthest from the furnace



In the wiring diagram above, the room thermostat controls the fire through the draft and check doors. A limit control, placed in the bonnet, is wired in series with the thermostat and checks the fire before it "runs away." A bonnet control starts and stops the fan. All units are low voltage, furnished by the transformer as shown and a three wire circuit is used. All wiring is colored with terminals similarly marked so that anyone can wire up the system using a diagram like this. These instruments are manufactured by the Pioneer Heat Regulator Corp., Dayton, Ohio.



In this diagram the three instruments used are a room thermostat which controls the fire, a fan control which starts and stops the fan and a limit control which is wired in series with the thermostat and serves to check the fire before it "runs away." All instruments in this system are line voltage and two wire. The instruments, like most on the market, are adjustable so that the contractor can set the instrument for the temperatures selected. The instruments shown, except for the damper motor, are products of the Penn Electric Switch Co., Des Moines, Iowa.

do not get air as warm as registers close to the furnace. If we used this plan, then we can select the fan "on" setting equal or slightly higher than the designed register temperature for the farthest register.

Fan "On" Settings

Here are some other factors which must be considered in both the selection of a register air temperature and the "on" setting of the fan:

1—The lower the "on" setting, the shorter is the period between the time the room thermostat calls for heat and the fan begins delivery.

2—The higher the "on" setting, the longer will be the lag between the time the room thermostat calls for heat and the fan begins delivery.

3—But, with a high temperature the hotter air satisfies the room thermostat more quickly so the fan operation is shorter after the fan starts.

4—With a sluggish fire or a "slow" fuel lower "on" settings mean more continuous fan operation, whereas a "fast" fuel will stand a higher fan setting and a lower limit control setting.

5—Generally speaking, lower settings mean more continuous fan operation and higher settings more intermittent fan operation.

6—The general character of the heating system must be considered. For instance, if the installation has only fair air distribution, in other words, only as many registers as the law allows, the chances are that a higher temperatured air should be used in order to stimulate room air turbulence and eliminate cold air pockets. If there are plenty of registers, a lower air temperature might be used with its more continuous and gentler circulation throughout the rooms.

7—And, of course, that "doubtful" room where the C. F. M. and the distribution are just on the line may have to take their margin of safety from the "on" setting of the fan.

Generally speaking, 150 degrees for the "on" setting seems today to be most popular. Probably this is due to a general preference for a 140-degree register air temperature and also to contractor's experience with much higher or much lower settings with doubtful results. This is not to say that 150 degrees should be chosen arbitrarily, but rather that contractors have found this temperature to be a happy medium from which to start adjustment.

A questionnaire sent out recently disclosed that today the range in fan "on" settings is between a low choice of 125 degrees and a high choice of 175 degrees. One well known engineer stated that he thought this "on" setting was generally too low and that from 200 to 250 degrees would be better because the heat loss in most residential duct systems is a whole lot more than ordinarily figured and that as much as 60 and 70 degrees of loss may be found, especially in low velocity systems. This sounds like a good starting point for some investigation.

The "Off" Setting

Now we should consider the other end of this fan control setting —the "off" temperature for the fan. This brings up some entirely different problems which likewise must be considered.

These problems are:

1—The low setting provides the time and temperature differential during which the fan runs.

2—The greater the difference between the fan "on" and fan "off" settings the longer the period during which the fan continues to run.

3—The low setting prevents "cold" air from being blown into the room.

4—When the "low" setting is only a few degrees lower than the high or fan "on" setting the result will be short blasts of air from the registers according to the furnace's ability to generate heat.

5—If farthest rooms are also exposed, care must be taken to insure delivery of air of register temperature, therefore "off" setting is critical in the system having one or more long branches.

To elaborate on these points a little farther, most fan controls are adjustable for both "high" and "low" settings. The greater the temperature differential chosen between "on" and "off" the longer will be the period during which the fan runs. For instance, if the fan starts at 150 degrees it will run longer or more continuously if the "off" setting is 110 degrees than it will if the "off" setting is 135 degrees so long as the regenerative ability of the furnace is equal in both cases.

Operating Conditions

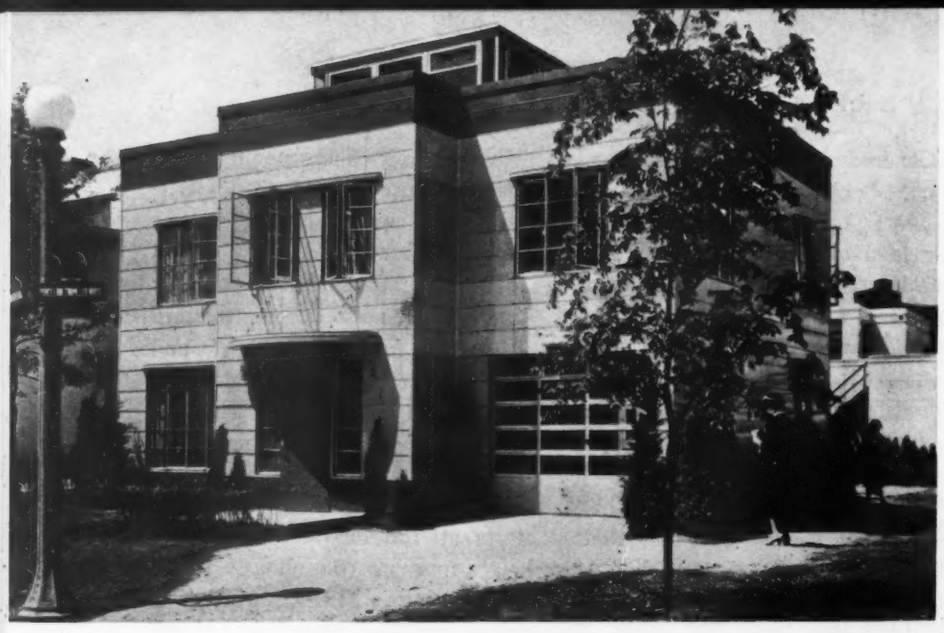
This brings up another point. We should remember that many furnaces operate under adverse conditions. The draft may be poor, the firing may be haphazard, clinkers and ashes may retard fire pickup, in other words the furnace is not as responsive as we should like. Under these conditions if the "on" and "off" settings are close together or very high the fan may start and stop time after time while the fire is picking up and the owner is likely to think that the system is faulty and the control not so good.

Many contractors have discovered that in systems where there is no fire limit control the operation may be synchronized to outside weather conditions by letting the "off" setting of the fan control remain at one temperature setting all during the heating season but raising the high or "on" setting in cold weather and lowering the "on" setting in mild weather.

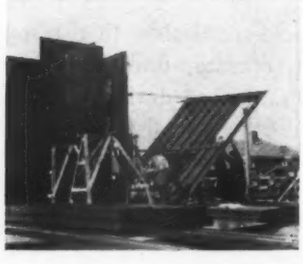
In this system we are discussing where the limit control is used this changing of the fan "on" setting need not be used because the limit control will do the same thing better.

In the September issue we will continue discussion of this system and explain how vital to this system is the limit control and its settings.

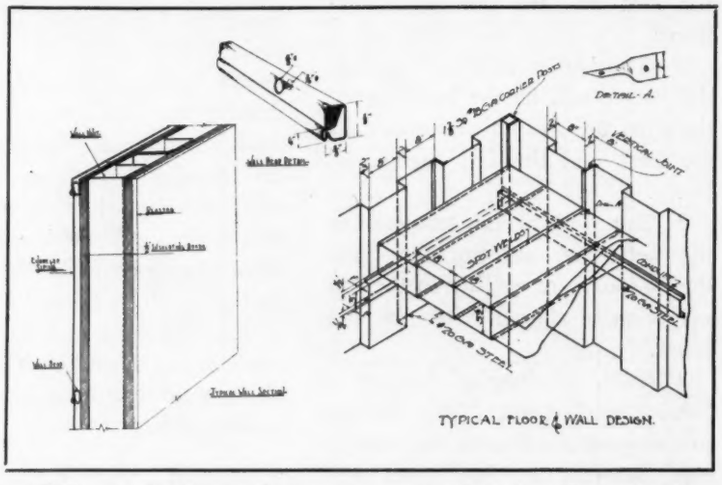
Metal Houses at the Century of Progress



The American Rolling Mill Co.-Ferro Enamel Corp. house employs light steel beams and walls of box-like units assembled in wall high sections. The exterior is enaemeled steel.

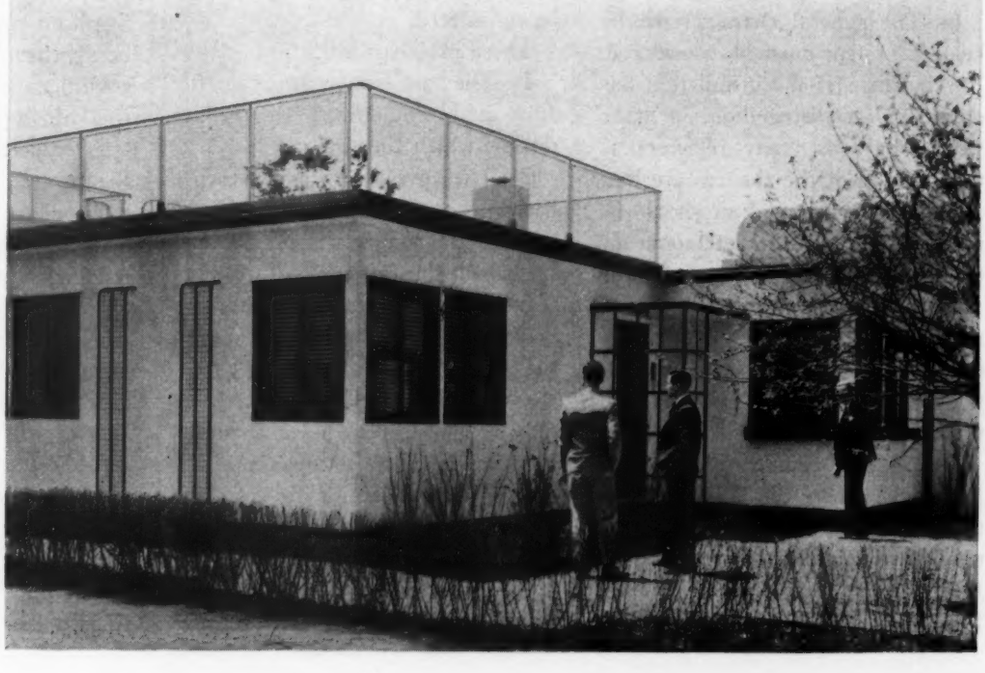


Erecting a wall section of the Armco house. Window and door openings are made in the wall before erection.



Walls of the Armco house are composed of box-like pressed sections welded in the shop. Insulating board is fastened on the inside and outside. The interior may be plastered while the finished exterior is enameled steel sheets. Floors are also metal.

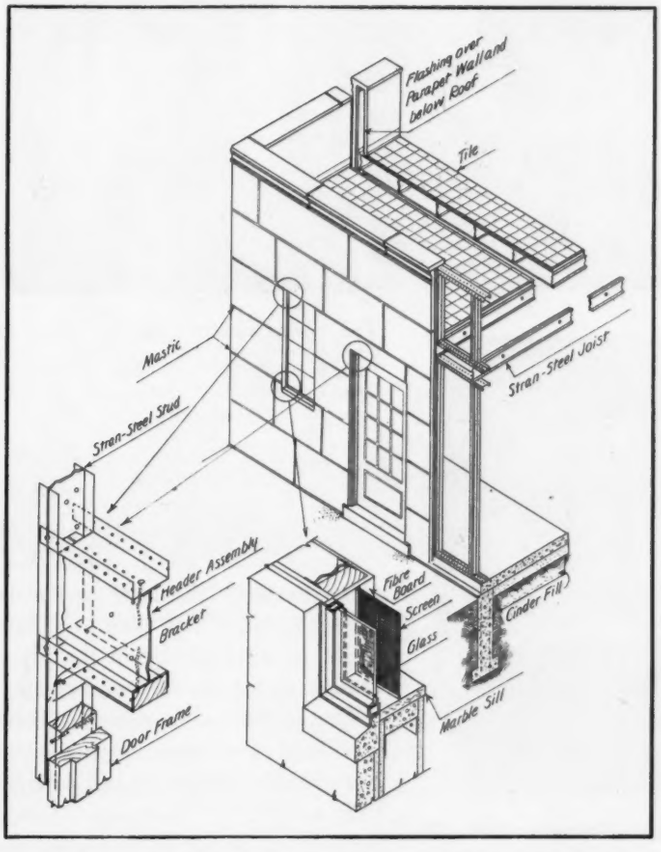
The all-steel, frameless house of General Houses, Inc., uses a steel chassis with the pressed steel panels bolted on. Inland Steel Co., cooperated in designing and fabricating the house. The house is designed for mass production.



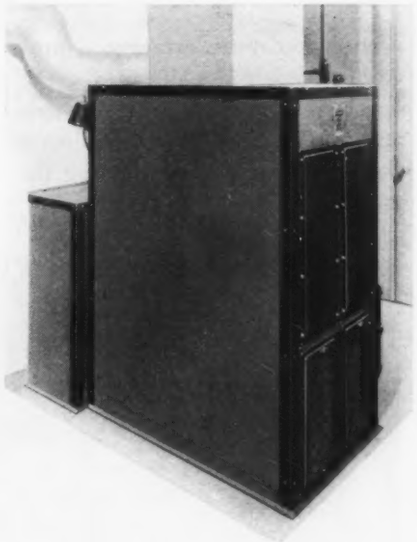
This construction picture shows the application of the enameled exterior sheets over the insulation in the Armco house. The horizontal joints employ a bead as shown in the detail to the left.

The Stran-Steel house has the modern flat surfaces, large windows and flat roof and is designed for economy of construction, fire-resistance and low cost. The Century of Progress house uses a vitreous enameled sheet of Toncan enameling iron backed up with one inch of light weight concrete. Edges of the sheets have a small binding of Enduro stainless steel. Republic Steel Corp. furnished the sheets and strips while the concrete was applied by a patented process by the Maul Macotta Corp., Detroit.

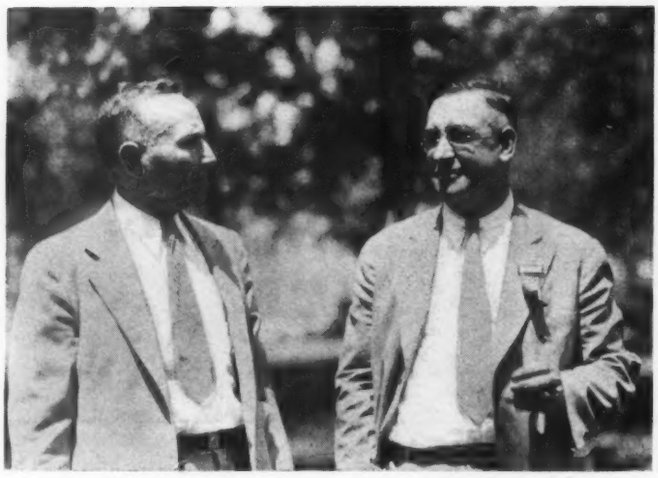
Many readers will visit the Century of Progress this summer. These metal houses and the many exhibits of heating equipment should be visited and studied. Visitors will find exhibitors eager to answer all questions and demonstrate.



The Stran-Steel house employs a light pressed steel framing as shown. The exterior is a special steel and concrete panel. The drawing shows the essential features of the design and construction.



A Sunbeam gas fired air conditioning unit is installed in the Stran-Steel house and is operated for visitors. Baseboard registers, 5 inches high are used. The heater room is on the first floor. Ducts pass along ceiling joists and then drop down the studs to the registers. Return air is drawn up to other ceiling joist ducts. Cooling by fan circulation will be demonstrated during the summer



Left—Past President Joe Dersher and right—President H. L. Orton.

The Ohio Convention

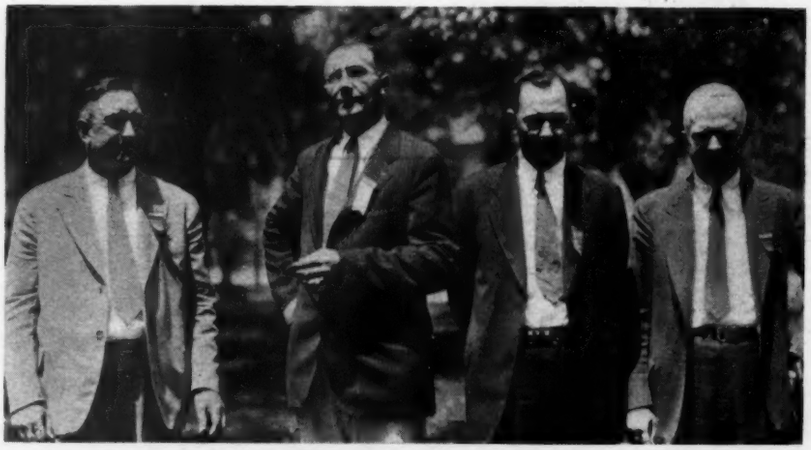
THE 1933 convention of the Ohio Sheet Metal Contractors Association, held July 18, 19, 20 at Cedar Point, Sandusky, was staged, attended and enjoyed with all the enthusiasm of the years before the depression. An attendance of about 150 members, ladies and guests took full advantage of the meeting location to combine business and pleasure in the ideal setting afforded by one of Ohio's best known resorts.

Officers, directors and the convention committee arranged a program to give those attending every opportunity to enjoy a pleasant visit and hear authorities discuss the many problems now facing the industry.

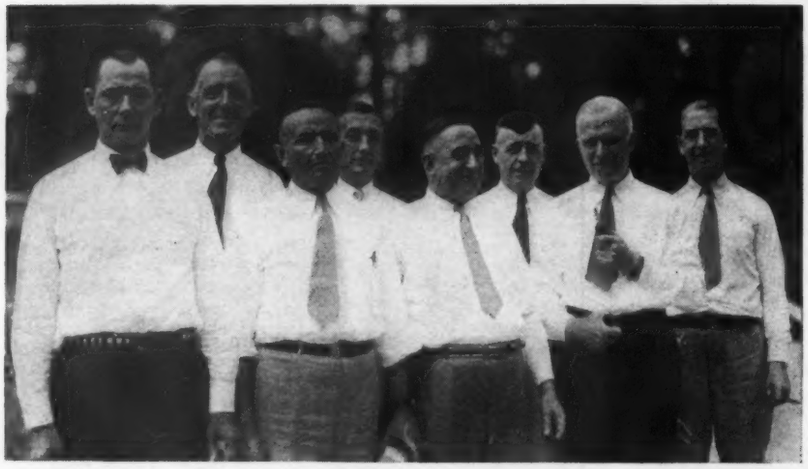
The most important session was that of Wednesday afternoon when the entire period was devoted to a presentation of the National Sheet Metal Contractors Association industrial recovery code led by W. C. Markle, national secretary. Secretary Markle read the tentative code which has been prepared and then opened the meeting to questions and discussion.

As might be expected, the discussion was intimate and thorough. Members wanted to know all about the tentative code and how the National Industrial Recovery Act will effect the sheet metal, warm air heating and allied industries. Secretary Markle answered numerous questions after which action was taken to guide the local and state groups in order that Ohio as a state might be instrumental in the preparation of a code for our industry.

One of the questions was—"How can local and state organizations cooperate in preparing and submitting a code?" Secretary Markle replied that so far as he knows the government prefers to deal with national associations and through



The newly elected officers. Left to right—President H. L. Orton, Vice President C. M. Gundlach, Treasurer Wm. E. Feiten, Secretary D. A. Mannen.



Officers and directors for the coming year. Left to right—Treasurer Wm. E. Feiten, Cleveland; Director Charles Grote, Cincinnati; Director Joe Dersher, Toledo; Director W. H. Lauer, Columbus; President H. L. Orton, Akron; Director A. E. Bogen, Columbus; Secretary D. A. Mannen, Cleveland; Director A. E. Munkel, Columbus.

national organizations reach smaller groups indirectly but expeditiously. If this is correct, then it is probable that one code covering sheet metal, warm air heating, air conditioning, fabricating, roofing, ventilating, blow piping will be accepted by the government leaving to smaller organizations the job of inserting in the code the proper clauses to cover local labor agreements.

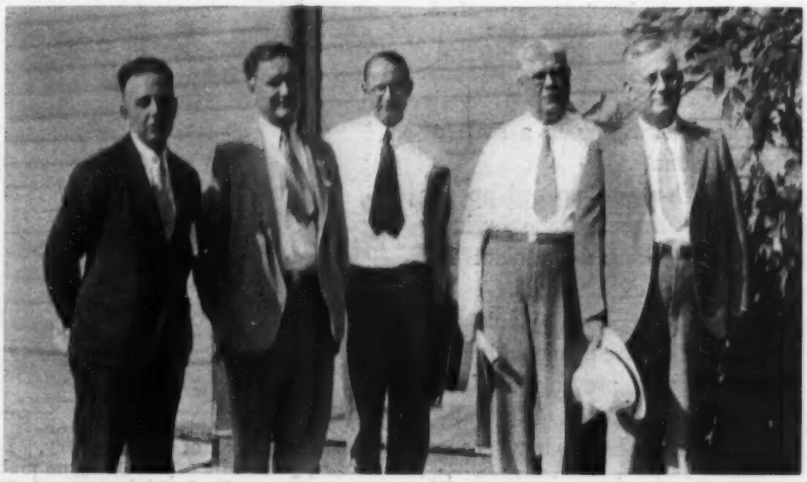
It was decided to adopt in general principle the national association code for the Ohio organization and for each local organization to submit to its full membership the code as now drawn up reporting to the state board of directors as soon as possible with suggestions for the labor clause and for any other amendments or suggestions warranted by specific local conditions.

In this connection, a word might be said about the labor clause. As originally prepared a working week of 40 hours was selected, but secretary Markle stated that he felt sure the government would demand a shorter week in view of the widespread unemployment and general decline in work of all kinds. He suggested that a 35 hour week would probably be acceptable and local organizations were directed to work toward this end.

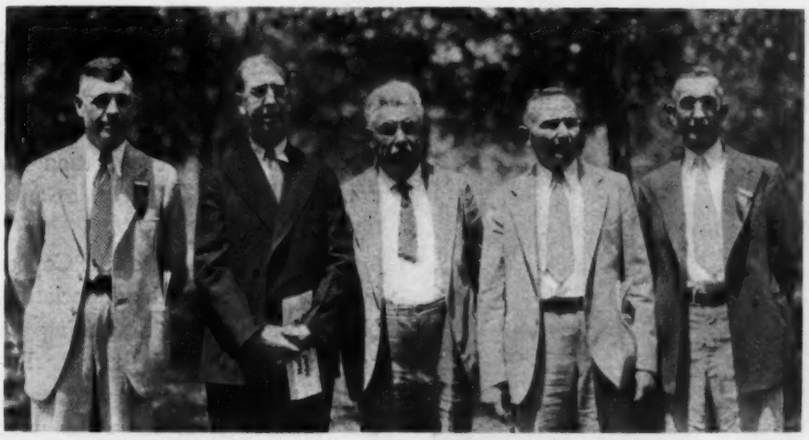
Some discussion was had on the advisability of advocating a 35 hour week to be checked every six months in order that more hours per week might be worked during rush times with reduced hours in slack times providing that at the end of each six months period the 35 hours per week were averaged. Definite ruling on this has not been made, but will probably be decided when the code is acted upon.

Labor rates, of course, came in for much discussion. Secretary Markle stated that he thought the government would look with disfavor upon too great a wage spread and that a high rate for large cities and a much lower rate for small towns might be criticized in favor of a more uniform rate of pay. This again will not be ruled upon until the code is submitted.

As now prepared the national association code follows the general suggestions for codes and covers participation, designation of divisions in the industries, labor clause, code clauses, trade practice rules, powers for enforcement, bidding and the necessary organization to operate and enforce the code. Just as quickly as possible copies of the code will be available to firms and organizations; in the meantime full information can be obtained from AMERICAN ARTISAN or the national secretary.



Officers of the Jobbers and Salesmen's Auxiliary. Left to right—Secretary-Treasurer Lee W. Gillespie; President George G. Auer; Vice President J. T. Hagen; Director D. A. Hossler; Director C. E. Waller.

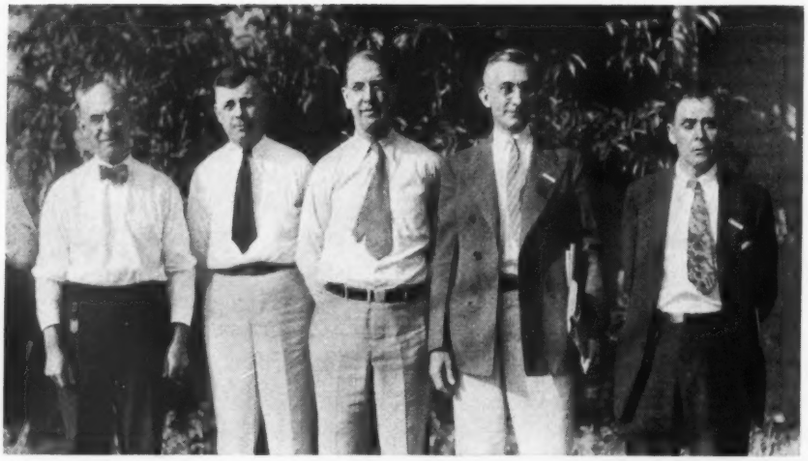


Newly elected directors. Left to right—A. E. Bogen, Columbus; A. E. Munkel, Columbus; F. J. Hoersting, Dayton; Joe Dersher, Toledo; W. H. Lauer, Columbus.

Addresses

The 1933 meeting was marked by an unusually high class group of papers and addresses. On Wednesday morning the Honorable A. P. Lamneck, Member of Congress, Twelfth Ohio District, and well known in the furnace and sheet metal industries presented a resume of the accomplishments of the national government since March 4, 1933, and listed seven outstanding accomplishments.

"The country," declared Mr. Lamneck, "was in an extremely difficult position on March 4. Confidence in government and business was at low ebb and drastic measures were needed. The first move was to restore confidence in the financial condition and in financial institutions. The bank moratorium was declared and only sound banks were opened. Beginning in January, 1934, all deposits in banks will be



Columbus delegation. Left to right—Fred Mirick, A. E. Bogen, A. E. Munkel, W. H. Lauer, J. D. Cantor. The arm at the left belongs to H. S. Haslett who "didn't take"

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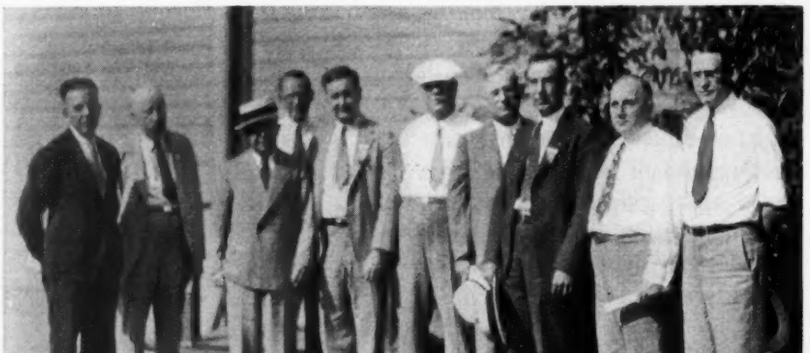
guaranteed according to a scale of deposit amounts.

"Prohibition was opened up for the sale of beer and the business resulting from this stimulant has been beyond expectations.

"The Home Loan Bank law was enacted to give owners a breathing space and prevent wholesale foreclosure on homes.

"The Farm Loan law accomplished or is accomplishing the same things for the farmer and additional regulations will eliminate additional farm problems.

"The Securities bill will eliminate many of the bad practices which resulted in the loss of so many millions of dollars for the investor.



Above are most of the auxiliary. Left to right—Lee G. Gillespie, J. G. Henninger, J. C. Miles, J. T. Hagen, George G. Auer, D. A. Hossler, C. E. Waller, T. C. Livingston, A. W. Fromm, A. C. Barackman.

The Akron delegation. Left to right, Seated—H. L. Orton, Frank M. Marquis, E. W. Krammer. Standing—A. A. Hoffman, Morris Roth, Oscar Hodgson, Charles B. Akers, M. E. Lind.

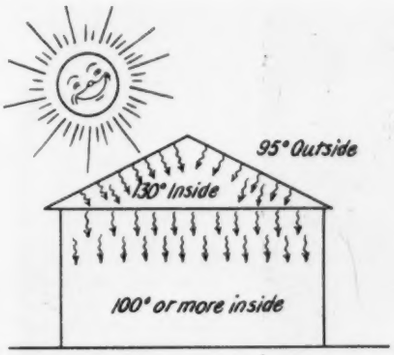
"And lastly, the National Industrial Recovery Bill is one of the most far reaching pieces of legislation ever tried by any nation. It is revolutionary in intent, application and thought, but if it is successful at least seven million unemployed will return to work.

"These tremendously interesting and vital governmental changes and regulations can succeed," declared Mr. Lamneck, "only if every citizen cooperates 100 per cent. No individual or industry can go forward or prosper alone. We have learned that prosperity is possible only when all industries are busy and prosperous. What we need now is complete cooperation by every individual, industry, association or group."

William Crane, Jr., of the Copper and Brass Research Association, New York, read an interesting paper on "Copper and Brass." Refering to the antiquity of copper and brass several instances were cited to show that these two materials have been used since 6000 B. C. Interesting data was then presented to show the march of civilization and copper and brass from those early dates until today.

Reference was made to the data contained in the association's publication "Sheet Copper" a handbook which covers in detail practically

(*Continued on page* 27)



Cooling With Attic Fan Ventilation

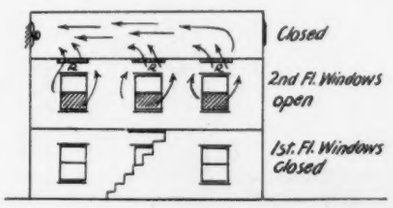
WITH air conditioning progressing at an astonishing pace and with the home owning public definitely interested in summer cooling, the idea of cooling by ventilation is today occupying the thoughts and plans of many engineers and firms interested in meeting the public's demand for summer comfort with a reasonably priced and satisfactory system which brings comfort by ventilation.

The idea is not new. It has, in fact, been used for many years in larger buildings. As now being tried out, the scheme makes it possible to ventilate and slightly cool the entire house through an attic ventilation system.

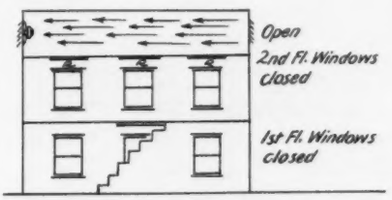
Homes of today generally speaking, are built for appearance more than comfort. True, modern appliances are installed in these new homes, such as electric refrigerators, automatic heat, etc., but a woeful lack of attention is given to cooling and ventilation. Ceilings are built lower, windows fewer and smaller, all with the idea of savings in cost.

Many of these homes are rendered intolerable during the summer months by a blanket of hot air that is concentrated in the attic. In most homes the attic is an oven which builds up heat all during the day, this heat being transmitted through the ceiling into the bedrooms. This means that for hours after the sun has gone down, the bedrooms are so hot, it is practically impossible to occupy them. It has been shown that when the temperature is 95° outside, it is 130° in the attic and 100° or more in the second floor rooms.

Naturally, then, if we prevent the attic temperature from increasing and at the same time bring it down to that of the outside, an appreciable cooling operation is effected.



To cool the second floor, close the first floor windows and open those on the second floor. The fan will draw cooler outside air into the bedrooms and on through into the attic.



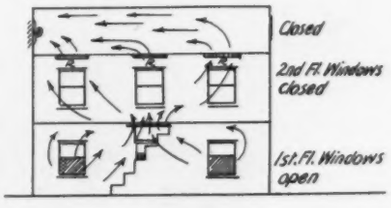
To keep attic temperatures down and eliminate ceiling radiation close all windows and pull outside air through the attic.

By the simple installation of an attic cooling system it is possible to reduce the temperature to 95° in the attic space and thus 95° in your second floor rooms. This means that the temperature in your second floor is at least 5° cooler than it would be ordinarily, which is an appreciable drop in temperature. In addition to this temperature drop there is an appreciable volume of fresh air circulating at all times through the entire house. This, of course, provides not only cooling, but ventilation as well.

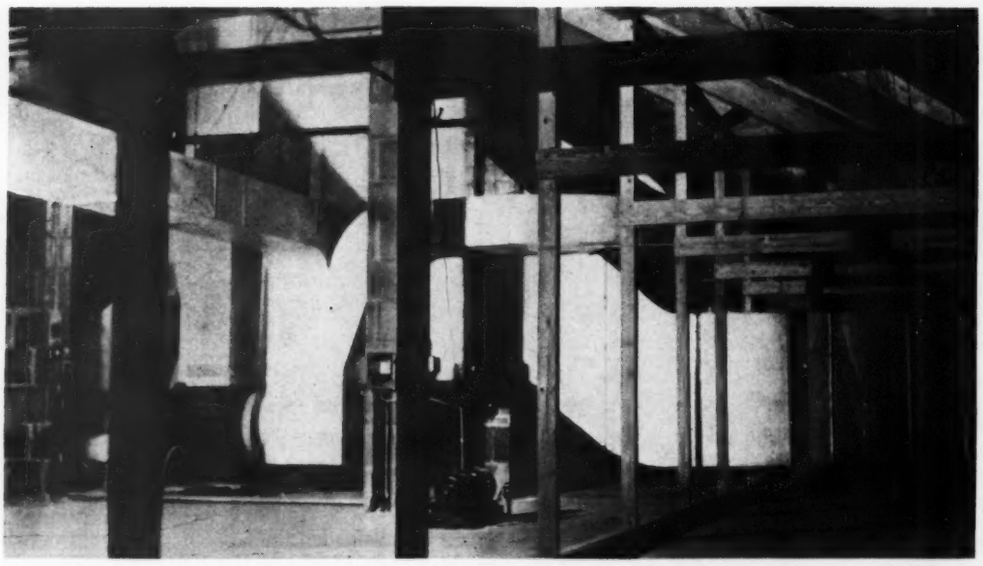
The cost of an attic cooling system is within reach of practically every home owner, and the cost of operation is very moderate.

In making an installation of this kind, the only thing that is necessary to do is to figure the cubical contents of the top floor and then divide this by two, to give the CFM that the fan should handle in order to give the proper results. The fan can be located any place in the attic space that is convenient. The motor, of course, should be a two speed capacitor type so that it will not interfere with the radio, and should have two different speeds. It is necessary to install in the ceiling of each of the bedrooms and bathroom, grilles of ample size so that there will not be over 350 ft. velocity through them. These grille openings can be closed in the winter time if desired, but in most cases they will be left open because it has been found that there are days in the winter that the home needs ventilation.

It has been found by tests that the best results are obtained from an installation of this kind by starting the fan shortly after noon and running it at top speed with the windows closed on the second floor and open on the first floor until it is time to retire. Then run the fan on low speed with the windows closed on the first floor and open on the second floor until the house is as cool as the outside temperature. It usually is not necessary to run the fan after the sun has set, because with the fan operating from noon on, the heat never has a chance to build up either in the attic or in the bedrooms.



To cool the first floor shut second floor windows and open those on the first floor. The fan will maintain a circulation of air.



The attic space in the main building houses several large fans and the large section ducts. Into the attic are brought the exhaust from auditorium and toilets and out of the attic run the flues which supply air to the class room heaters. Below is an exterior picture of the building showing its size and arrangement.

Duct Fabrication and Erection On A Cleveland School Building

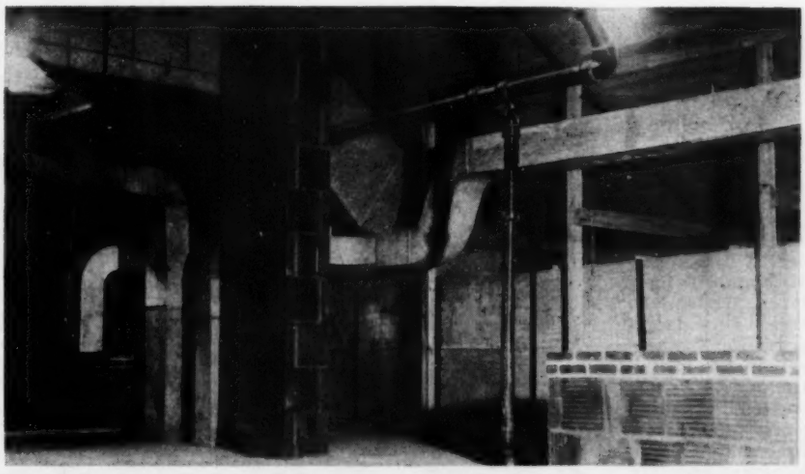
UNDER conditions existing during the past two years the ventilation contractor has been faced with the problem of arranging his handling, hauling, fabricating and erecting in such a manner that his margin of profit is protected and not dissipated because of delays and excessive shop and field costs.

This problem has been most pronounced on those contracts where the job is located at some distance from the shop and where ducts of large and small sizes with many fittings necessitate considerable field handling. Solution of the problem has been worked out by individual contractors principally on the basis of an analysis of the particular job under contract and an intimate knowledge of how he can get the most efficient and least expensive field and shop operations from his mechanics.

Some contractors have favored the fabrication of all duct work in the main shop, leaving only erection to the field crews. Other contractors have favored field shops for most or all of the fabrication, leaving only the general supervision to the main shop forces.

A typical example of the former method of control is found in the ventilation contract completed some months ago by the Young Ventilating Company of Cleveland on the Shaker Heights high school. This high school is several miles from the Young shop. An analysis of the contract convinced Mr. Young that shop assembly would require expensive hauling, so all sheet metal ducts, fittings and housings were manufactured in the shop—i. e., cut, formed and edges turned. The assembling was done on the job. A grooved rail in the shop on the job was used to hammer the ducts together. A brake and square sheer were used on the job for emergency fittings only.

This high school ventilation system is probably one of the largest school systems in the country. The general outline of the building as shown on the exterior photograph shows a main building of three floors and a high attic and five



All sheet metal was delivered at the building cut, formed and with edges turned ready for fabrication in the field shop. This view in the attic shows exhaust ducts and a corner of a heater flue.

wings of two stories each which project out from the front, back and both ends of the main building.

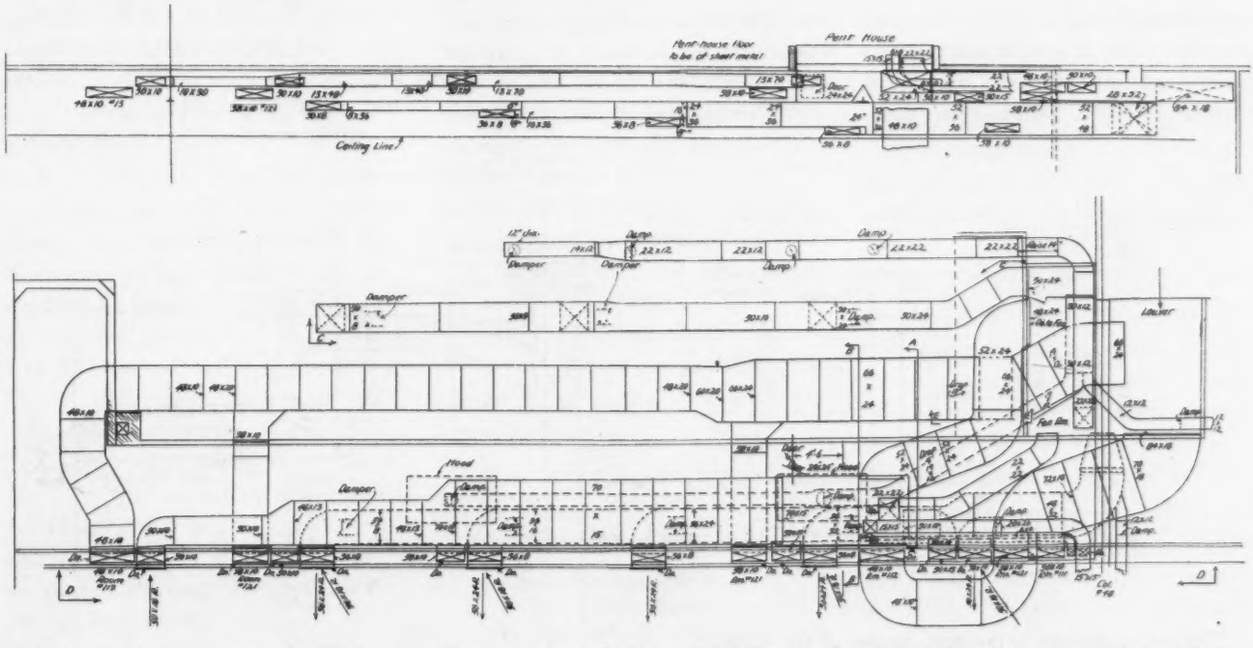
This high school is, by the way, one of the largest buildings of its kind in the country and contains such educational, recreational and operative adjuncts as a swimming pool, two gymnasiums, laundry, complete woodworking and metal working shops, kitchens and cafeteria, power house, two auditoriums with movie equipment, in addition to the usual class rooms.

For each of these departments a heating, ventilating and exhaust system was specified, each system varying according to the needs of the particular department.

For the auditorium supply system, or indirect system, the fan, heating coils and filters are all located in the attic space. The exhaust for the auditorium is through ducts at the baseboard into space or plenum chamber under the entire auditorium floor. This space connects with a large galvanized iron flue to the attic fan chamber for recirculating this air. The gymnasiums and swimming pools are heated by unit heaters and radiators recessed in the walls. The class rooms are heated with a system of unit heaters located against inside walls next to the corridors. Fresh air is taken into these unit heaters through galvanized iron ducts (not masonry) leading from the attic space to the unit heaters. The grilles for exhaust are located over the entrance doors of the class rooms and in the walls next to the corridors and lead into a grille six inches below the corridor ceiling. This air is discharged by gravity from the space of the corridor through the stair wells, up the stair wells to the extreme top of the stair wells, and is picked up here from space by the 48 by 48 inch galvanized iron duct. The duct leads to the tower and the air is discharged through louvers by gravity.

The heaters are either set on the floor or recessed. Exhaust is through the grille shown in the corridor.

The fans required were purchased by the heating contractor under whom the Young company were sub-contractors for the ventilation.



The details above are reproduced from the Young company's shop drawings showing the detailed layout, sizing and dimensioning for the shop mechanics. This is a part of one attic fan system.

The Young contract did, however, include the fan required for the laundry exhaust system.

The Young contract required more than 59 tons of galvanized iron and 2 tons of angle iron.

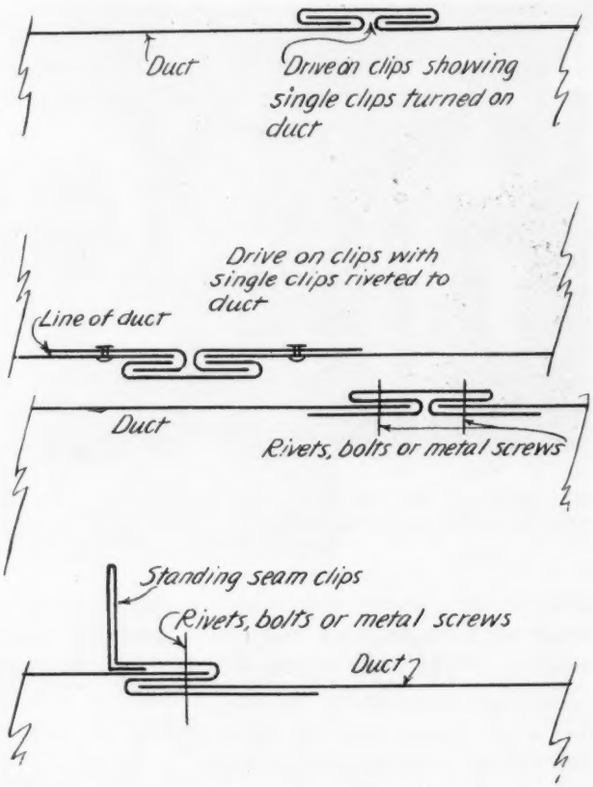
To handle the contract as expeditiously as possible the architect's plans were taken and one-half inch scale drawings made for all the metal work. Typical details from the scale drawings are shown in some of the drawings. These drawings show that all sizes, fittings, turns and locations were shown in full with reference to wall lines and masonry flues. These drawings indicated location and sizes of transitions, equipment to be served and furnished complete information for the mechanics.

Mr. Young describes his fabricating and erection methods as follows—

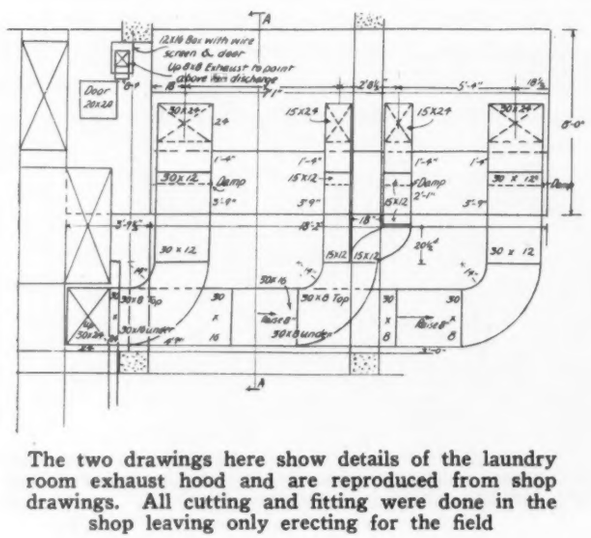
"All sheet metal was delivered to the job shop cut, formed and edges turned and fabricated there.

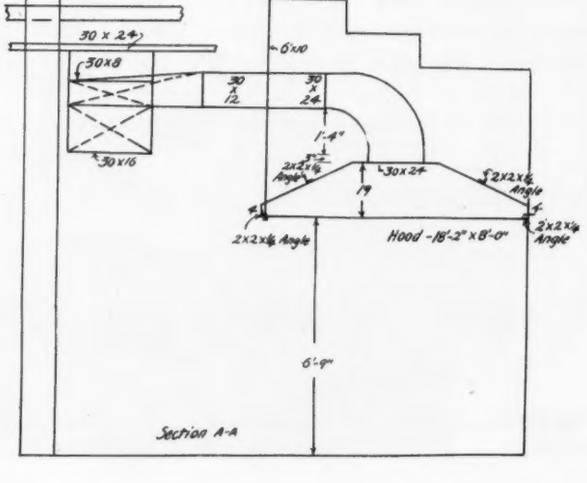
"The larger ducts in the attic space and behind the cafeteria suspended ceiling were erected with a hammer edge on four sides. Erection of the large ducts was accomplished by erecting the sides and then placing the top sheet with angle iron stiffeners and joints riveted to this sheet. Edges were hammered over on the corners and then the bottom sheet was placed in the same manner. This was continued sheet after sheet until the duct was completed. We have found this method the most economical in erecting large ducts. This method requires two men on a scaffold. The large 126 x 34-inch duct in the attic space would have required four men if another method had been used. Where angle iron joints are specified on a job, the above method could not be used.

"The standing edge joint shown on the detail was used on the top and bottom of the large ducts. 'S' clips were used on the sides of the ducts with the exception of the 48x48-inch ducts in the attic space. The joint, as shown, was used on the top, bottom and sides of the 48x48-inch ducts. In order that these joints would not match at the corners, joints were broken so that the side joint would come half way between the top and bottom joints. On the smaller ducts approximately 8x10-inch to approximately 12x30-inch small 'S' clips were used on tops and bottoms and drive-on clips on the sides of the 8-foot section. The smaller ducts were erected in eight-foot sections with the clips and stiffeners riveted to the duct. In using the small 'S' clips on top


Duct
Drive on clips showing single clips turned on duct
Drive on clips with single clips riveted to duct
Line of duct
Duct
Rivets, bolts or metal screws
Standing seam clips
Rivets, bolts or metal screws
Duct

Duct section connection employed one of four types of joints. All four types are shown here. The large ducts were joined with hammered corners and erected as two sides, then the top sheet with stiffeners and last the bottom sheet. Even the largest ducts were erected by two men on a scaffold.





The two drawings here show details of the laundry room exhaust hood and are reproduced from shop drawings. All cutting and fitting were done in the shop leaving only erecting for the field

and bottom and drive cleats on the sides we found the ducts easier to install than if the drive cleats were used on all four sides.

"Angle irons were used for stiffening the ducts at intervals of 4 feet. The angle irons were supported by riveting them to the ducts. On the 48x48-inch duct in the attic space, the standing edge joint was used at intervals of 36 inches. This joint supports the ducts and eliminated the angles. On the large 126x36-inch duct, angle irons were used in connection with the joint riveted to the center of this sheet which was 36 inches wide.

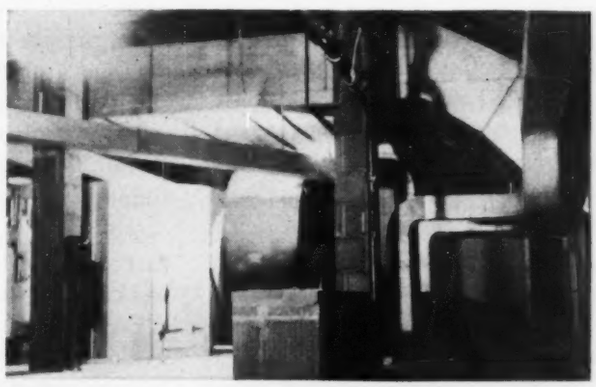
"In some of the rooms of the building the radiators were recessed in the walls. This required sheet metal housings which were fabricated from flat sheets in the job shop and assembled for installation as complete housings before the radiators were placed.

"A similar procedure was followed in fabricating the large housings for the fans. The housings were located on the floor with chalk lines and the angle iron framing erected. Flat sheets were then cut, squared and formed and applied sheet by sheet."

The photographs of the duct work in the attic show that some rather complicated fittings were required for the smaller exhaust systems and that the large ducts were located above the risers so the branches could be connected as directly as possible. These branch connections were cut into the main ducts after the main ducts were hung. All fittings, transitions and elbows for the systems were also assembled on the job.

The collecting system for the wood working shop is all round pipe suspended visibly in the shop and extended to the cyclone. As first installed, the cyclone was suspended by four ¾-inch rods from the concrete floor slab above. This caused so much vibration in the gas range in the cooking school above the cyclone that the supporting rods were cut out and the cyclone supported on an angle iron frame bolted to the boiler room floor.

Precautions were taken to eliminate vibration and noise from the fans by using a fan base consisting of two layers of 2 by 6-inch yellow pine separated by a 2-inch layer of cork between the wood. These bases are bolted to the floor and fastened to the fan bases with lag screws. Where rope drives are used the base is extended to carry the motor.



Many sizes of ducts were required, but the fabricating and hanging operations were identical for all metal work

The Ohio Convention [*Continued from page 22*]

every application of copper. This booklet, in connection with the association's service department, supplies the answers to any question relative to the use or application of sheet copper.

Mr. Crane then cited the ten recommendations for the use of copper. Briefly these rules are—(1) Use 16-ounce copper either hard or soft according to needs for most roofing, flashing and ornamental work; (2) Lay all sheets smoothly and evenly; (3) Avoid sharp bends; (4) Be sure free movement is provided; (5) Use cleats rather than nails; (6) Use only copper or brass nails for cleats or strips; (7), (8), (9) and (10) Be careful on soldering, forming, seaming to get tight, strong, long lived work.

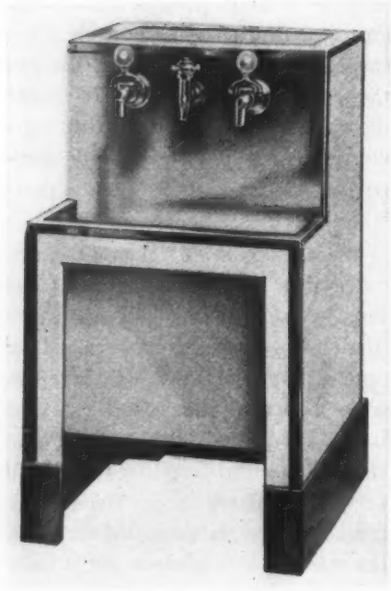
T. R. Walker, of Columbus, talked on air conditioning. "Some economists," declared Mr. Walker, "say that air conditioning will be the next big business. I don't believe it will, in the sense that the economists believe, because they are talking about true air conditioning and we furnace men know that the term air conditioning is a misnomer. Very few really air conditioned jobs have been installed and so far as I can see the number will not be of the proportions claimed. The trouble is cost, because real air conditioning means expensive equipment, expensive operation.

AUXILIARY OFFICERS

Pres.—George Auer
V. Pres.—Joe Hagen
V. Pres.—A. K. Anderson
Sec.-Treas.—Lee Gillespie
Sergeant—C. T. McGaugh

"What will be a big business is semi-air conditioning wherein we heat, clean, circulate, humidify in winter and circulate, clean, dehumidify in summer. The big stumbling block is cooling and this problem has not been licked yet so far as Mr. Average Homeowner is concerned.

"We have, in some instances, and we can, in many instances, kill our own game by selling every system as an air conditioning job. They are not air conditioning jobs and we ought to take steps to protect the public and ourselves by informing the home owner exactly what he can buy, how much it will cost and what it will do. If we don't, we surely will run air conditioning into a premature grave and the fault will be our own."



Gerken, in Toledo, Fabricates and Sells Beer Equipment

THE Gerken Company, one of Toledo, Ohio's, oldest sheet metal and furnace heating firms, has established itself in the fabrication and sale of beer dispensing equipment with a line of units suitable for the smallest or the largest dispensor.

When the sale of beer was permitted, the company had ready for sale a complete line of units ranging from an inexpensive counter box to the complete combination service bar and work table. These units were made up using several materials, covering a range of prices, and a program had been mapped out beforehand so that the manufacture and sale of the equipment started immediately.

The Present Market

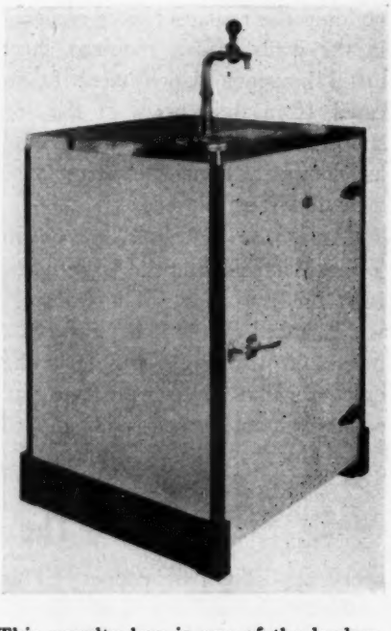
Since those first days of the return of beer the sales and manufacturing program has been expanded, additions and improvements have been made in accordance with customer's changing demands until the company is now looked upon as one of the leaders in this field.

And after more than two months of operation the company believes that this field is a profitable one for the sheet metal fabricator who can and will do good work and has the initiative to work up a market.

"We grant," says T. R. Gerken, "that there are and will be many types and qualities of beer dispensors and we understand that the sheet metal man has a real problem in deciding whether to make the cheapest possible or to turn out a unit which is up to his standards of workmanship, quality of materials and general reputation. The answer is not as simple as one might think because there is tremendous pressure for cheap units, but this works itself out.

"We are pleased today, twelve weeks after the official return of beer to note how rapid has been the change in sentiment of buyers who wanted the cheapest possible equipment during the first weeks, but who have now awakened to the fact that quality is just as important in beer dispensing equipment as in any commodity.

Shown on this page are three types of beer dispensers ranging from a low priced, wood frame, to the enameled novelty box and the full metaled three-faucet dispenser



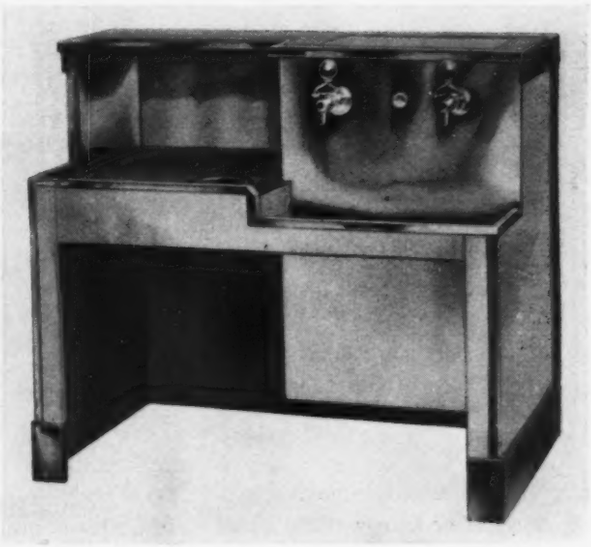
This novelty box is one of the leaders of the Gerken line. The exterior is enameled and the top may be had in several metals

"At first all our calls were for cheap units. Customers were afraid to invest any more money than necessary and believed they could get by with mediocre equipment until such time as an established business could be determined.

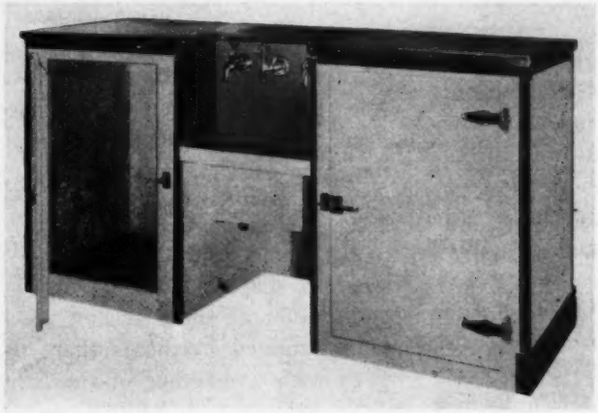
"Now we are finding that many of our early customers are replacing their first equipment with better units, more substantial, better looking. For example, in the territory we serve many dispensors opened with home

made units, put together by the local carpenter or even made by a handy man. Numerous faults were discovered with equipment of this kind. Such units were difficult to keep clean. In many cases such equipment actually spoiled the beer.

"Now these dispensors have a good idea of the quantity of beer they can sell; they have built up a clientele, and they realize that appearance is important.



At the right is one of the leaders of the line—a two-faucet dispenser and work table for remote connection to the barrels. The top is Monel metal with copper or Monel faces



Left is an enameled dispenser with barrel compartments in the unit

Also, they are beginning to appreciate the saving in labor and supplies made possible by service bars which are easy to keep clean and sanitary.

Better Market Coming

"We believe that this trend is going to make possible the sale of better units, intelligently designed and manufactured by shops equipped to turn out substantial, attractive equipment. We, ourselves, are finding an increasing market for our better and more expensive units. Buyers are examining the construction with an eye to long, trouble-free service. Metals such as polished copper, stainless steel, are finding a market among buyers who want appearance and ease of maintenance.

"This trend will, as we see it, work to the advantage of the established sheet metal contractor who can turn out a good product."

Line of Units

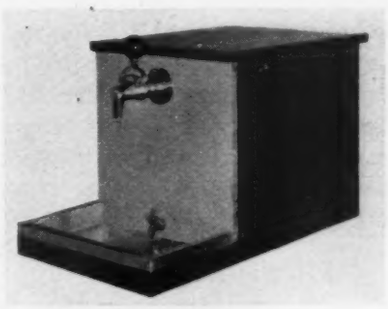
The equipment manufactured by the Gerken company is being marketed under the trade name Baristocrat. Included in the line are one faucet counter coolers; tap boxes of one faucet, two faucet and three faucet units; single and double compartment novelty boxes suitable for merchandise stores which do not have regular bars; single and double compartment service bars either with or without built-in work tables.

Much attention has been paid to construction in order to get a product which will stand hard useage, give attractive appearance and reduce maintenance. All units are designed to use ice as the cooling medium, but can be converted readily to mechanical refrigeration by the installation of cooling coils in the ice compartment.

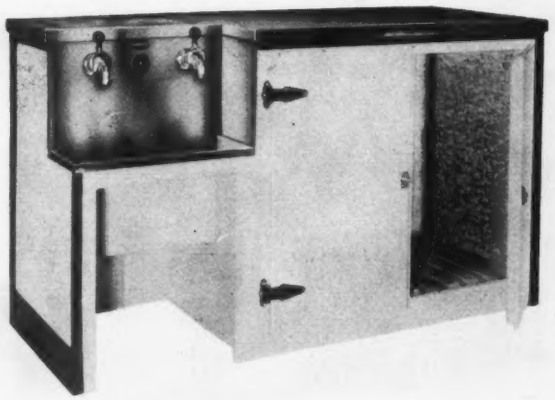
The general design of the cabinet is much the same in all units. Counter models and the lowest priced tap box are made with a white pine wood frame. For the remainder of the line a 16-gauge frame is used with panels of auto body stock. The panels are enameled and baked in the Gerken shop using ovens and machines which were originally used in the production of the Gerken line of radiator covers. The enameled panels are alcohol proof.

Tops and working surfaces are furnished in any material, but Monel, stainless steel, polished copper are standard. Faucets of plain or elaborate design are supplied according to the wishes of the buyer.

Many interesting and important facts about cabinet design have been worked out. "We have found," says T. R. Gerken, "that considerable attention must be paid to the materials used. Our



This is an inexpensive counter box suitable for stores which do not have a bar



This service bar has steel frame, enameled exterior and either a composition or metal top. Metal tops may be either stainless steel or special metals like Monel

policy is to use only tinned copper for ice chamber linings. Galvanized iron is not permanent enough for this purpose. And ordinary copper develops a green slime that covers the lower coils and reduces the cooling effect. Tinned copper eliminates all these troubles and will last indefinitely.

"Working surfaces and sinks must be supported by a full wood surface or the metal will be dented, broken and opened up. To eliminate this we place a full wood surface under all working surfaces and place the metal tight against the wood so there is no movement in the sheets.

"An interesting thing we found in the cheaper units was the tendency to let the lining and facing sheets of the cooling box support the faucets. Faucets get hard service and they must be supported rigidly. We place a full wood strip in the cooler and bore holes through the strip for the faucet. This makes it possible to draw up the faucet tightly and keep it tight and permits rough handling, even leaning on the faucet, without tearing the sheets or the insulation.

Insulation

"Insulation and its placing are also important. We use slab insulation and the sections are cut accurately to insure good corner fit. In assembling the insulation the slabs are placed and the outside and inside surfaces are covered with aluminum waterproofing painted on. Where the front insulating section is cut by the faucet board the paint is applied over both insulation and wood. This gives a waterproofing paint film continuously over the entire interior.

"The doors of our units are light wood covered inside and outside with sheet steel. This makes a light weight door, provides a surface which can take and hold enamel. The light weight has the further advantage of giving long life where a heavy door, frequently slammed, has to be well supported to prevent sagging and warping."

Sales Methods

The territory now covered by the Gerken company includes southern Michigan and northern Ohio. The area is being extended through salesmen and direct mail.

At the present time small towns are turning in the most orders. How to get volume from small towns without running up the sales cost is, naturally, a problem. It has been solved partially by approaching the local ice company as a possible distributor for the units. The ice companies are, of course, interested in increasing their ice sales and the percentage of profit allotted them has made a sales effort on their part profitable.

The ice companies have been solicited through the mail and by personal calls. A form letter accompanied by photographs showing the units was mailed out to the ice companies and replies were followed up with a plan setting out the details of the proposition.

Electric refrigeration dealers, oil burner specialists and other sales agencies of this type; also free lance salesmen have also been drawn into the distribution program.

Floor Selling

To round out the sales program a display floor on which samples of all units are on view is maintained in the Gerken offices with a member of the firm or a salesman in attendance at all times. Buyers and salesmen are invited to come in and examine the units.

"We find it important," says the firm members, "to know as much as possible about the dispensing business. Many buyers do not know just what type or size of unit they require and we make it a point to find this out by asking questions. To make a permanent sale we try to find out what type of trade will be served, how many customers and how much beer, whether the barrels will be in the unit or in the basement, what kind of a pressure system will be installed, what type of bar is contemplated, what type of store is used, and so forth.

"When we know all these things we can give intelligent recommendations and not under or over sell the buyer. We find this pays."

This month's cover picture shows workmen erecting a section of wall in the Armco-Ferro Enamel house at Chicago's Century of Progress. The picture shows the sectional assembly, method of placing and general characteristics of the design.

A

Automatic Heat *and* Air Conditioning Section

MUCH has been heard this last year of the "packaged" air conditioner. Particularly emphatic have been those prognosticators who delight in looking into the future and picturing each of us possessing conveniences now considered luxuries.

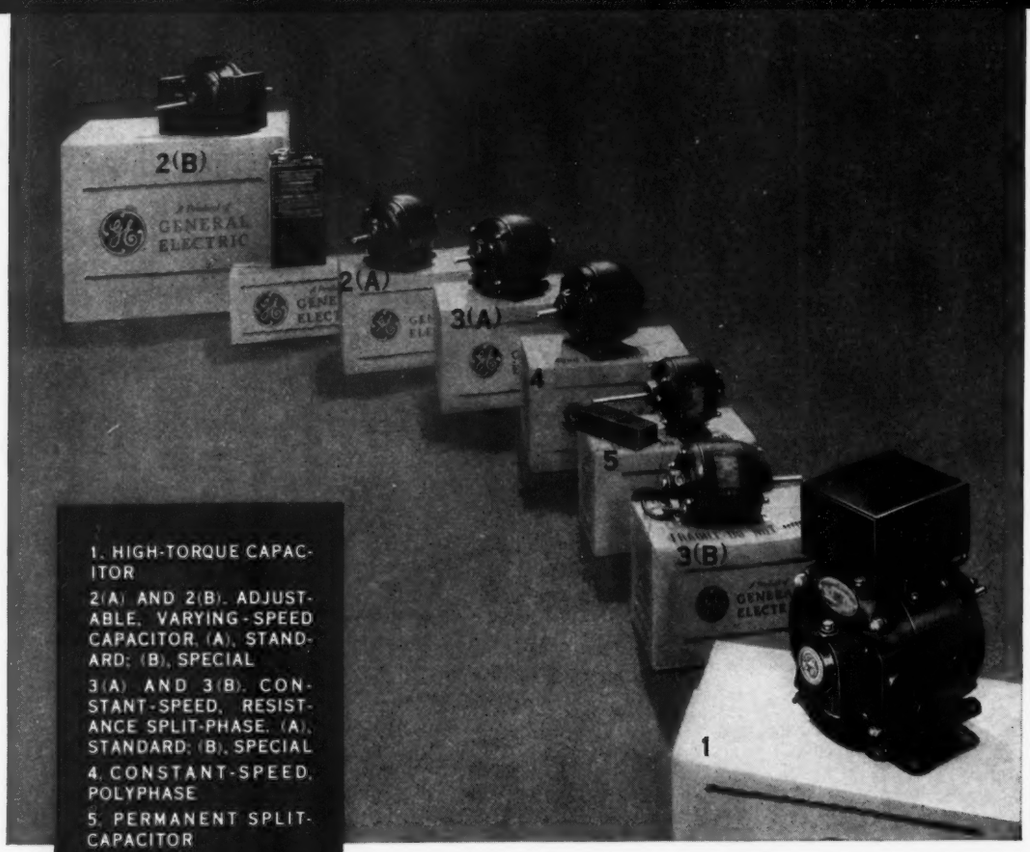
. . . . The packaged conditioner is one of these items and we hear, lately, that every American home will be air conditioned within a few years.

. . . . We, in the active heating business, know that air conditioning is a misnomer and we hesitate to assert that every home will have true air conditioning. We are willing to assert, however, that forced air with its attendant comfort, circulation, cleaning and humidifying is ready for the public and we believe that changes toward more compact, lower priced units are bound to come.

. . . . Whether or not these low priced units will be substantial and economical remains to be seen.

. . . . This issue of Automatic Heating contains an article by Platte Overton describing some of the tests and findings on a "packaged" unit which has been operating this past winter. Some remarkable disclosures are itemized.

PACKAGES OF POWER FOR AIR CONDITIONING



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This motor is *quiet*. Its design includes these modern features: drip-proof end flange with built-in terminal block which simplifies connections and avoids all necessity for splicing and soldering; greatly increased oil capacity; capacitor unit one-half as large as before; and many others of value to you.

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Railway Car Air Conditioners
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Refrigerator Fans
Room Coolers
Rotary Roof Ventilators
Schoolroom Heaters
Special Devices
Unit Coolers
Unit Heaters
Unit Ventilators
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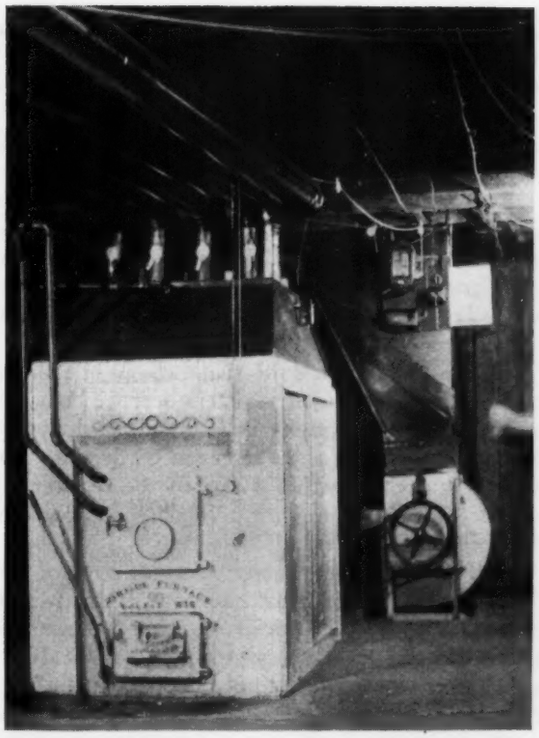
210-206

GENERAL ELECTRIC



A "Packaged" Air Conditioner

By Platte Overton

MUCH has been said, these past two years, of the "packaged" air conditioning system—the system which is to make air conditioning as universally popular as the automobile; as widely distributed as tooth paste—some say, our next big business.

Most contractors have some idea of what this packaged unit should look like, but most of these ideas are based upon private speculation and do not take into consideration manufacturing, selling, advertising and distributing problems. Nevertheless, the idea of a packaged unit is so appealing that probably units of this type will be introduced and sold within the next few years.

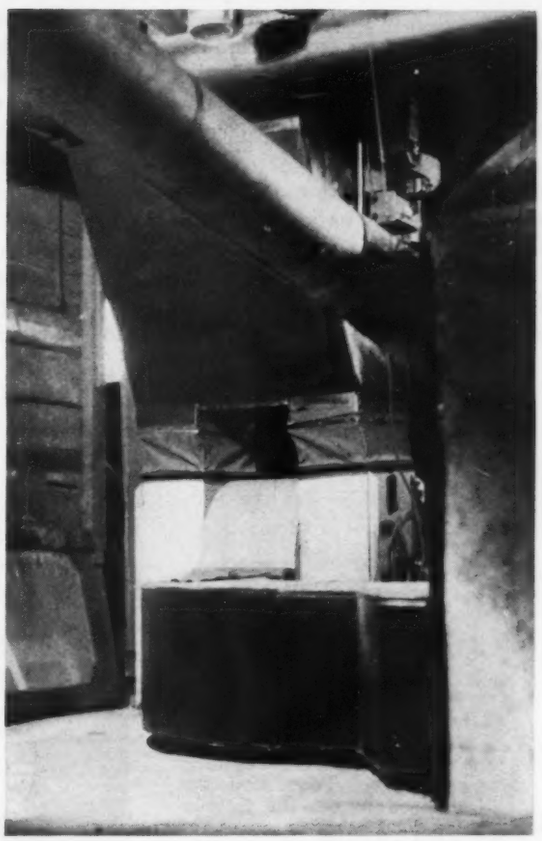
If the idea is sound, what kind of a unit will it be? What type of furnace will be used, what fuel will be advocated? Will accessories like the fan, filters, washers, humidifiers, controls, etc., come wrapped in paper like parts of a mechanical builder, and will these units be like the ones we now use? Will the ducts be cut and formed or will they be round pipe? Will such a unit find its buyers only among owners of small homes or will units be built for the big house? And lastly, what about appearance; will it be a "cheap" looking affair or will the buyer be proud of his purchase?

Faced with the depression and the restricted buying power of the average home owner, these questions of price and packaged air conditioning seem timely. With millions of home owners needing furnace replacements or repairs that will average from $100 to $250 for such alterations, a system that will sell for about $300 certainly has appeal.

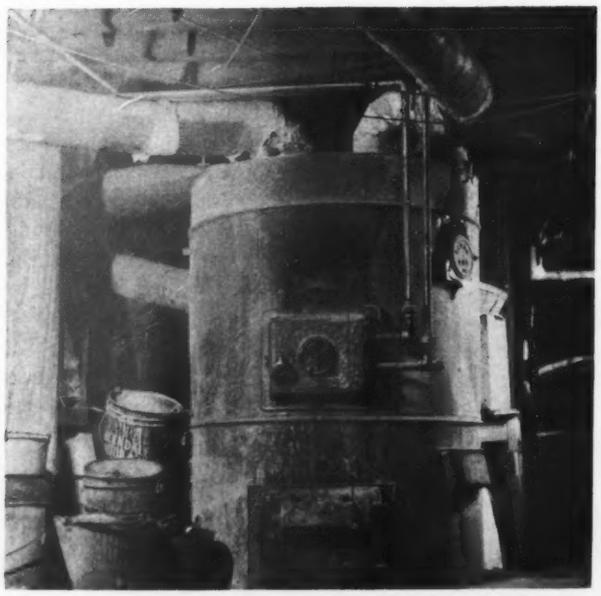
Last winter the writer was given a free hand in the home shown in the accompanying plans and cuts, to design and install a medium priced air conditioning system. While it will be impossible to cover all the results obtained in one article, the high lights will be touched and the test results worthy of careful analysis will be given.

The system was installed as shown and two days of 19 below zero weather failed to drive the thermometer down any lower than 78 degrees in any one of the eleven rooms.

Seven pet theories were put to test—(1) that one general cold air return is sufficient for the average home of this type, (2) that all warm air runs can be of one size, (3) that high velocities at baseboard sidewall registers are not as objectionable as commonly considered, (4) that one galvanized, painted, 6-inch high velocity air duct is more efficient and has less heat loss per running foot than the standard 8-inch tin asbestos covered pipe, (5) that such a system with 6-inch runs gives more satisfactory results on gravity with fan idle, than gravity sized pipes, (6) that the casings of a heater may be designed to eliminate baffles, (7)



This view of the blower and the front view above show the "packaged" air conditioner as installed during the experiments described here. Note the round pipe, all one size, the dampers, collars, elbows and the boot from blower to casing



This is the furnace which was removed. The leaders were patched and papered, the return shoe was open to the air, and despite heavy firing the rooms were never really warm

that where casting and furnace parts are air tight the check draft in the smoke pipe is unnecessary.

Some of the answers are found in the following:

1—One cold air return is sufficient for the average home where a mechanical system is installed. This may not apply to gravity systems, but with a pressure installation we have force behind the inlet air. This gives us the benefit of distribution against elements that would handicap the gravity flow. Infiltration and exfiltration are the answer, of course, to our question of: "Where does this air go?" For the average small bungalow we find four rooms with two sides each exposed. This gives us a 30-minute air change regardless of the type of heating system. Where mechanical systems are based on a 15-minute air change we find that in normal winter weather our fan will be idle about half the time. Hence, our infiltration and exfiltration is just about equal to the normal fan service. With one return, the location becomes important. It should be placed in the best position that will insure direct flow from the high infiltration area and also in some section not occupied for long intervals by the occupants.

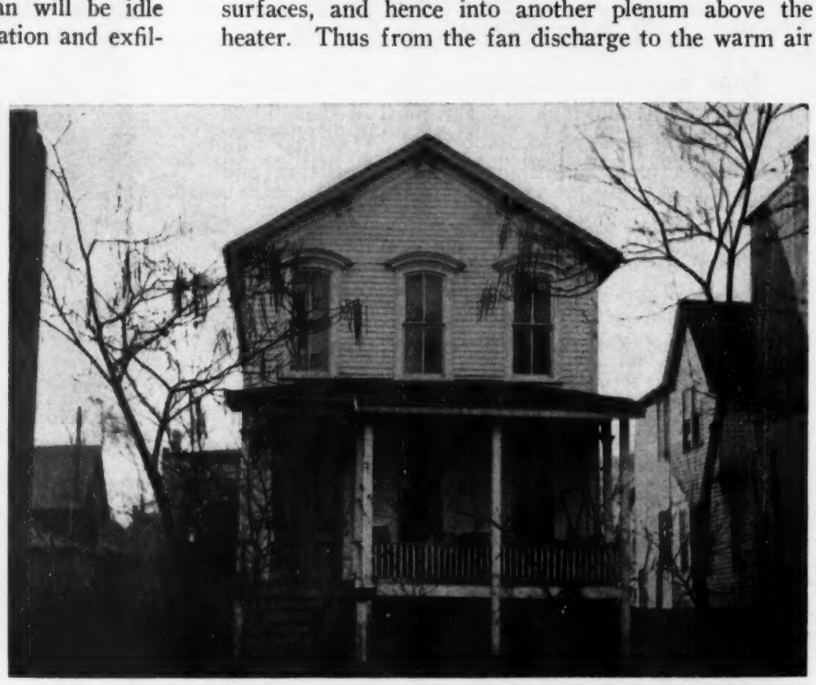
2—The advantage of uniform sized warm air leaders is the price. Where these runs are too small, two or more may be installed, and if distributed over a wide area in a large room, better distribution is the result. If these uniform runs are too large they may be dampered.

3—This is a finding of the test. While the velocity of these baseboard registers seemed high compared to the former gravity flow, the direct flow of air left the register at an angle of about 60 degrees. One could sit in a chair within 4 feet of the register with comfort. The large register face did not slow down the velocity to any perceptible degree.

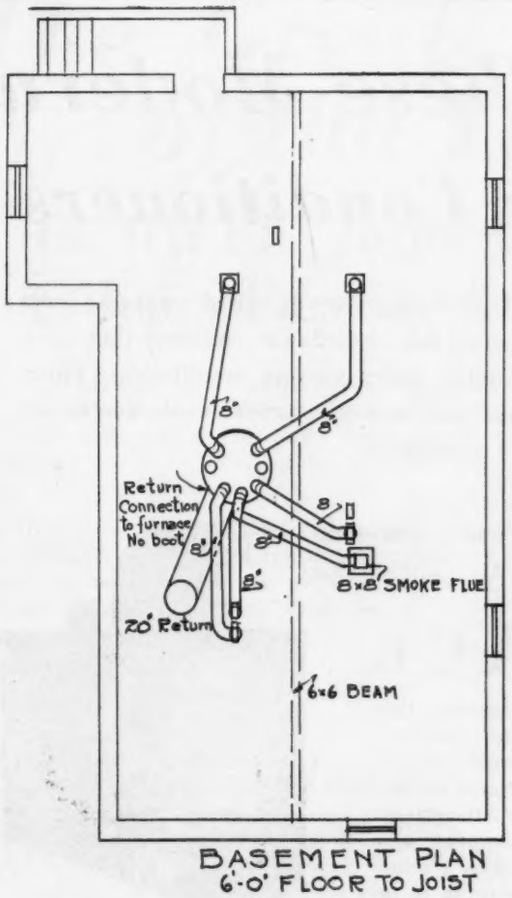
4—Here we have a mere matter of surface ratio. The more surface the more heat loss. Also we have the time element. The quicker the air reaches its destination the less the temperature drop. These 10-foot long tubes have ⅕ the joints necessary with 2-foot sections. The inside is smoother, the pressure loss comparatively less.

5—This is a question of balance. On the system in question all the runs worked on gravity service. This is practically never true of gravity service on mechanical systems where gravity sized pipes are used. The air of gravity flow generally leaves the casing through the shortest and largest runs. More air may flow by gravity from, say four 12-foot runs that are short, than will flow from nine 6-inch runs as shown, but the general distribution on the small, uniform sized pipe systems will be better.

6—The question of heater casings is important. The ideal plan would have an air plenum of about 15 inches of depth below the heater, with uniform and correctly proportioned air passage area over the heater surfaces, and hence into another plenum above the heater. Thus from the fan discharge to the warm air



The house has eleven rooms heated. It is exposed on three sides and is typical of the houses built about forty years ago. Permission was obtained to use the installation for testing purposes and tests of one kind or another were conducted all through the last heating season. The findings are related in the text


8"
8"
Return Connection to furnace No boot
8"
8"
8"

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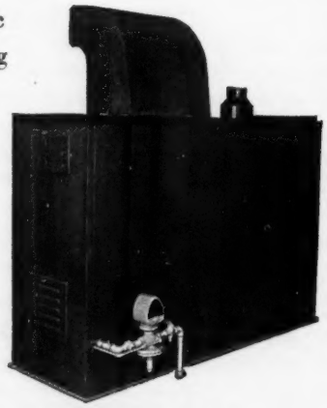

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Important developments are already planned and others are in the making.

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An Air Conditioner for the home that you can sell for less than $100.00 and make a handsome profit

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Heating men are astonished at the understanding of air conditioning displayed by the average home owner, and his great desire to air condition his home. That desire has been built up by years of education by the magazines, but he has not been able to satisfy it because of recent conditions.

The Miles Junior Air Conditioner was designed and built for just this situation. It is practical, sturdy, efficient, easily installed, and it gives the home owner the major benefits of air conditioning.

The low price sells it. Unheard of economy of operation, too, makes a great sales appeal. Costs less than 50 cents a month for operation.

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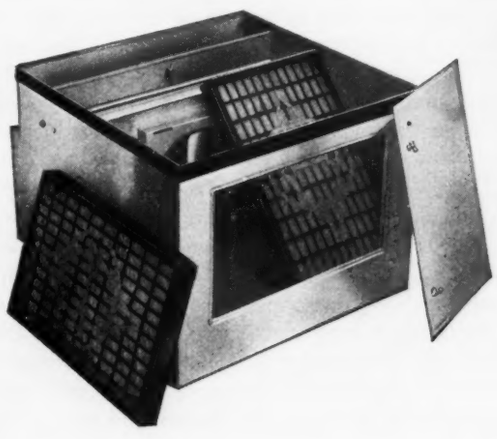
It is an opener for other business. When you attach a Miles Junior Air Conditioner to a furnace, you usually find other work to be done,—cleaning, resetting, repairs, etc.



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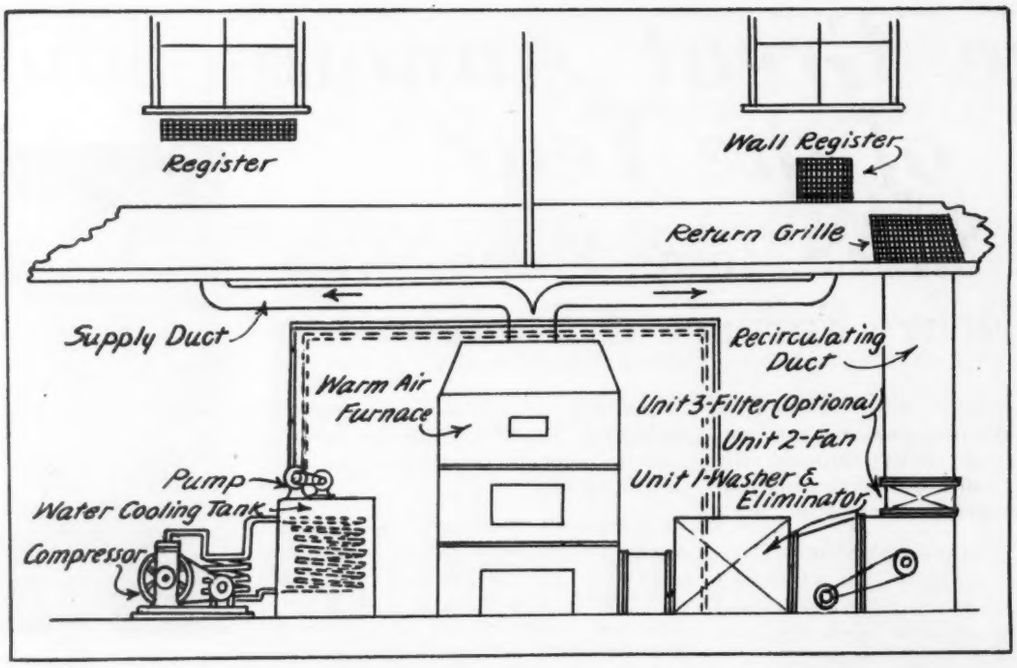


This isometric drawing shows a typical assembled cooling system as used with a warm air furnace, blower and either a washer or cooling coils

Comfort Cooling

By H. J. Macintire

Part V—Cooling With Mechanical Refrigeration

In this article Professor Macintire concludes his series on cooling. Cooling by air, water, ice and mechanical refrigeration have been discussed. Of more importance, each method has been charted for costs of installation and operation. The series contains, therefore, the answers to the important question—"how much will cooling cost?"

WE are now ready to apply mechanical refrigeration to our house and to see how much it costs to cool by this method.

The research residence, cooling the air with ice water inside of finned cooling coils, used a modulated by-pass damper thermostatically controlled by the temperature of the air in one of the rooms on the first floor. The air passing through this by-pass came in contact with surfaces cooled by ice water of practically a constant temperature of 35 deg. F. The air in the house was maintained at a very nearly constant condition of 80 degrees dry bulb and 45 per cent relative humidity.

These conditions corresponded to a moisture content in the house of 69 grains of moisture per pound of bone dry air, and a dew point temperature of 57 deg. F. The temperature at the register faces was about 60 deg. F. during the period of the hottest outdoor temperature. In this installation the air passing through the cooling chamber was always cooled to the same constant dew point temperature and, therefore, to the same weight of moisture content. This by-pass control was quiet satisfactory although, as indicated in the third part of this series, by-passing the water to give a varying temperature of water at the coils or in the spray chamber would have been satisfactory also as far as the dry bulb temperature of the air is concerned.

With electric refrigeration a similar by-pass arrangement would be desirable with the use of coils or sprays, although it does not seem that sprays are necessary for a residence out of the congested districts in the city. In any case, the finned coils are always dripping wet and a certain amount of washing is therefore being carried on continuously. The by-pass air cooler could therefore be cooled by water kept at a constant temperature by direct expansion coils on the suction side of the refrigerating machine. Regulation of the temperature can be secured by means of a thermostat set for the desired water temperature which will start the compressor at a certain maximum and stop it at

a certain minimum temperature of the water.

It is not necessary to keep the two temperatures closer than 5 degrees. In order that the compressor will not have to be continually starting or stopping, a reasonable amount of water should be supplied to be kept cool.

In commercial comfort cooling, direct expansion piping is used to advantage to cool the air, but use of this method is only recommended in the fractional tonnage machines. With the use of water and a water storage tank it is possible to get a different type of control by by-passing the water to the water cooling surfaces. By such an arrangement it is possible to get the desired temperature in the rooms by regulating the amount of water passing through the air cooling coils. This means that although the initial temperature of the water may be nearly constant the final temperature will vary with the amount of load. The compressor will stop as soon as the minimum water temperature is reached by the thermostatic control.

However, the by-pass damper is recommended and will probably give the better control. With this arrangement the volume of air moved by the fan will be constant and all of the air by-passed through the cooling coils will be cooled to the dew point temperature of the air leaving the coils.

As an example, if the water temperature leaving the coil is 41 deg. F. and the difference between the air leaving and the water leaving is 10 degrees then the final temperature of the air leaving the cooler will be 51 degrees. This corresponds to 55 grains of water vapor per 1.0 lb. of bone dry air. Of course, the air in the house will be more humid than 55 grains because the air of infiltration brings with it a much higher moisture content. The room air will tend to approach the value of 55, however, if an increased amount of air is by-passed through the cooling coils.

The capacity of the fan in the research residence is 1,475 cu. ft. per minute and the total volume of air cooled was 14,770 cu. ft. or the total volume of the house would be moved six times per hour if the fan displaces its full capacity.

Typical Problem

The research house, according to calculation shown on the data sheet had a comfort cooling load of 21,400 B.t.u. per hour, or—using 12,000 B.t.u. per hour as equal to one ton of refrigeration—21,400÷12,000= practically 1.8 tons of refrigeration. If the water going to the cooling coils is held at 35 degrees then the refrigerant will have to boil in the coils cooling the water at about 25 deg. F.

The water temperature entering the air cooling coils will be 35 deg. F. and the rise of water temperature will be using 400 gallons of water per hour, and the formula—

Heat absorbed=No. gallons×8.33× rise of water temp.

$$21{,}400 = 400 \times 8.33 \times \text{temp. rise}$$

$$\text{therefore temp. rise} = \frac{21{,}400}{400 \times 8.33} = 6.4 \text{ deg. F. and}$$

the final temperature of the water will be 35+6.4= 41.4 degrees.

The amount of surface required in order to remove 21,400 B.t.u. per hour from the air, using a mean temperature difference between the air and the water temperatures of 31.8 degrees, and a coefficient of heat transfer of 5.0 will be:

$$\text{Area, in sq. ft.} = \frac{21{,}400}{31.8 \times 5.0} = 135 \text{ sq. ft.}$$

The weight of water to be used, cooled to 25 degrees, in order to store up refrigeration during a period of 10 minutes with a rise of temperature of 5.0 deg. F. will be:

$$\text{Stored up refrigeration required} = \frac{1.8 \times 12{,}000 \times 10}{60}$$

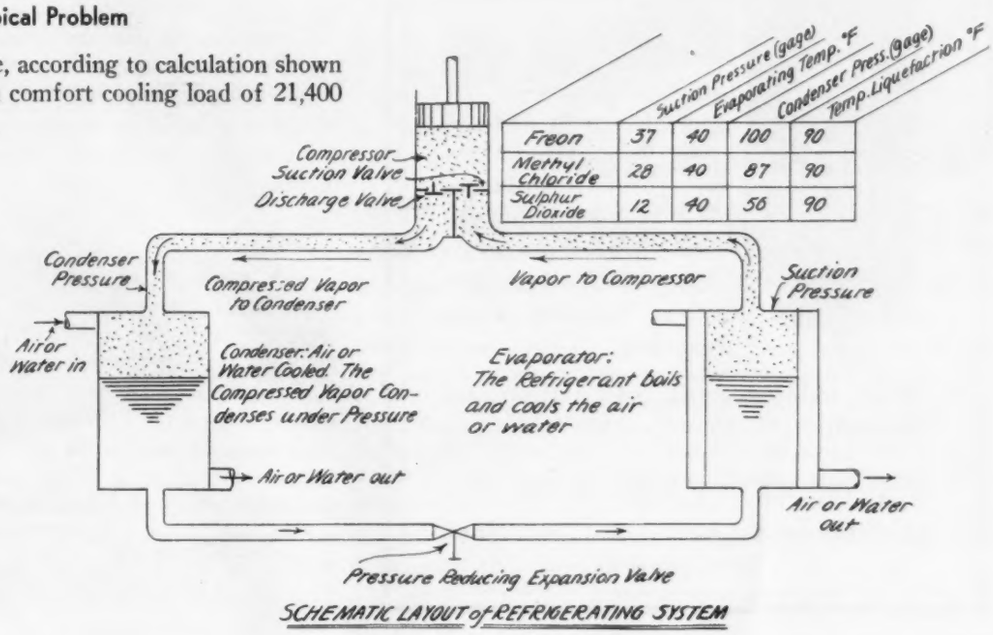
$=1.8\times200\times10$ and this amount must be equal to the weight of water, in pounds, times the allowable rise of water temperature. The weight will be therefore—

$$\frac{1.8 \times 200 \times 10}{5.0} = 720 \text{ lb. or } 11.5+ \text{ cu. ft.}$$

and a tank 3 ft. by 3 ft. by 2 ft. high will provide about 50 per cent more volume than the amount specified.

If the air leaves the cooling coils at 60 degrees and

A mechanical refrigerating unit operates on physical laws shown in this schematic drawing. Parts which do the work shown may vary greatly in design and operation, but the principle of cooling is shown here.

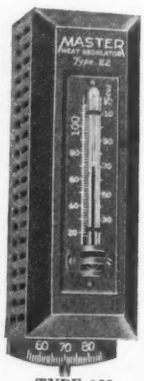

Suction Pressure (gage)
Evaporating Temp. °F
Condenser Press. (gage)
Temp. Liquefaction °F
Freon 37 40 100 90
Methyl Chloride 28 40 87 90
Sulphur Dioxide 12 40 56 90
Compressor Suction Valve
Discharge Valve
Condenser Pressure
Compressed Vapor to Condenser
Vapor to Compressor
Suction Pressure
Air or Water in
Condenser: Air or Water Cooled. The Compressed Vapor Condenses under Pressure
Evaporator: The Refrigerant boils and cools the air or water
Air or Water out
Air or Water out
Pressure Reducing Expansion Valve

SCHEMATIC LAYOUT of REFRIGERATING SYSTEM

Comfort AND Economy

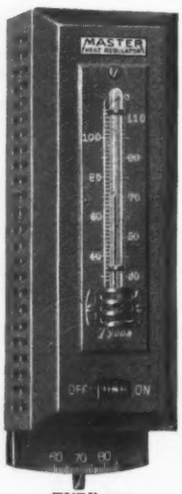
•

Spurred on by a desire to achieve the utmost in heat regulators, pointing ever to reaching the maximum in comfort and economy, the engineers responsible for the faultless performance of Master Heat Regulators have produced two outstanding examples of unfailing performance at low cost.



TYPE 122

The Master Heat Regulators, Types 122 and 144, control with perfection the heat necessary to most comfortably and economically heat the homes in which they are in operation.



TYPE 144

Very small current in the thermostat circuit —platinum iridium contacts — extremely sensitive thermostatic elements—non inductive motor starting switch — powerful, quiet motor—all of these features are designed into the Master Heat Regulators and are responsible for their use in so many installations, where the *best* is demanded.

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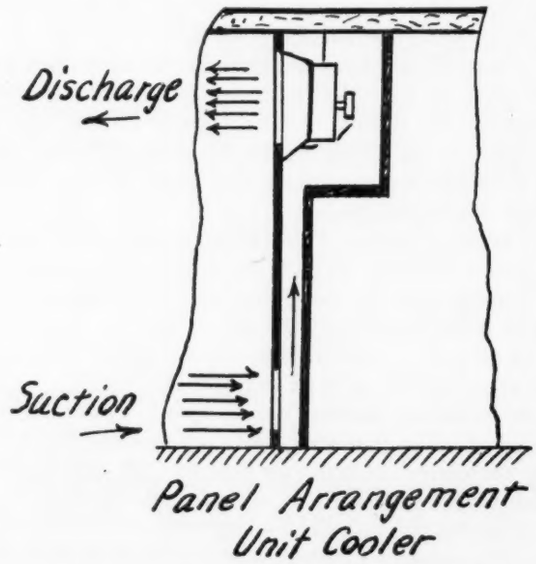
the temperature of the air in the house is 80 deg. F., the heat absorbed by each pound of air will be the specific heat [psychometric chart for the temperature of 60° F.] times the rise of temperature=0.2467×20 =4.934 B.t.u. per minute. The number of pounds of air to be circulated through the cooling coils will be, for the load of 1.8 tons of refrigeration,

$$\frac{21{,}400}{60\times 4.934}=72.3$$

and the volume of air necessary to be circulated per minute will be the weight in pounds times the volume of one pound at the condition in the problem or

$$72.3\times 13.33=964 \text{ cu. ft. per minute.}$$

As the only means of cooling is in the proper distribution of conditioned air it is evident that this 964



Unit coolers are versatile pieces of apparatus. In this drawing such a unit can circulate the air and cool one room

cu. ft. per minute is the minimum number of cubic feet that can be used to absorb the load of 1.8 tons with the temperature difference of 80—60=20 degrees. Therefore the fan capacity of 1,475 cu. ft. actually installed is a move on the safe side which would allow for overload capacities or greater ventilation should this be desired.

Costs

A refrigerating machine operating between the temperature limits of 30 and 86 degrees liquefaction temperature in the condenser will require about 0.75 hp. per ton of refrigeration and so 1.8 tons will require 1.35 hp. or slightly over 1 kw. The water requirements, using a ten degree rise of water temperature in the condenser will be 2.8 gal. per min. per ton of refrigeration, or about 5 gal. per min. for the present problem. At 5 gal per min. the water requirements per day of 24 hrs. will be 5×60×24=7200 gal. which at Urbana water rates will amount to $1.03 per day. This added to the power cost of the compressor motor

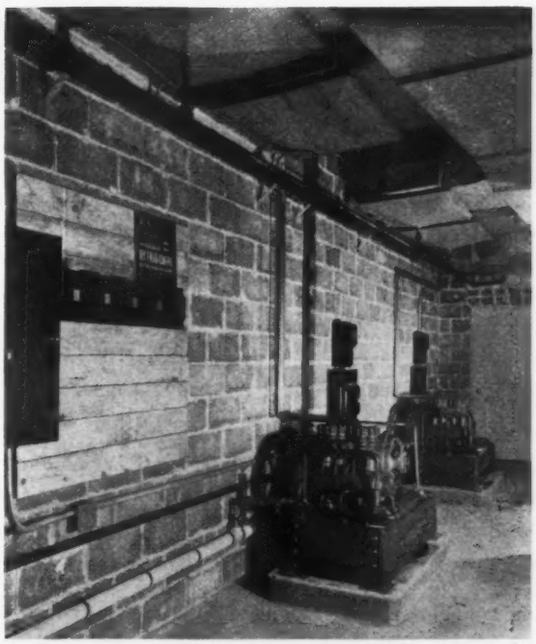
at 3c per kw.hr. or $0.72 will make $1.75 for power and water.

In electric refrigeration there is always an opportunity for changing the operating conditions so that less water will be used, but as the rise of the temperature of the condensing water becomes greater the condenser pressure increases and therefore the power consumed by the compressor motor also increases. It is quite possible that considerable less water could be used without much greater cost of power and the total cost would be thereby reduced. Just what the economical point will be is another question.

A cooling tower, even, could be installed which would be a still further economy, but such installations are unusual for small plants and they make the plant complicated. As a rule the small plant should be designed for simplicity rather than maximum economy. This is seen in the so-called household electric refrigerating machine which is air cooled resulting in a higher condenser pressure, compared with water cooled condensers, and a corresponding power cost. But the design is extremely simple from the point of view of attachments to the box in order that it may be installed easily in the home.

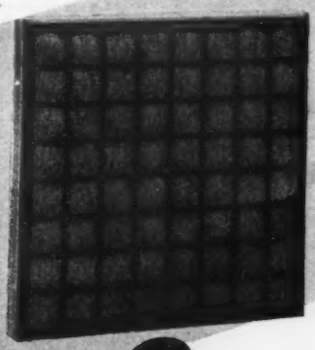
Ice Vs. Refrigeration

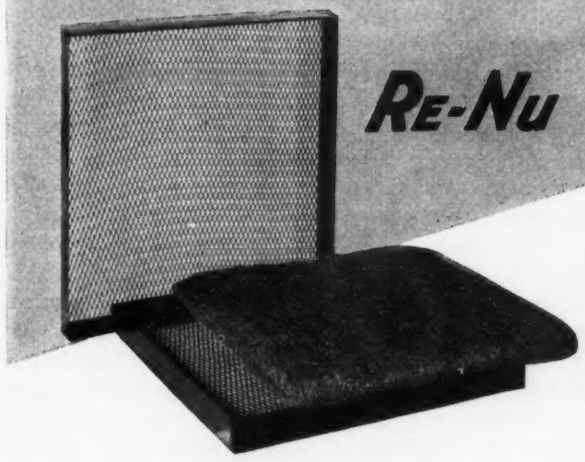
Comparing the above cost of $1.75 with what would be required in the case of ice at $4.00 per ton or $1.8 \times 4.00 = \$7.20$ it would seem as if one should not go any farther, but the first cost of the electric refrigerating machine wil be from $1,200 to $1,500 as compared with the first cost of the ice cooled plant which will cost from $500 to $700. This amounts to an increase of cost of the machine of about $700 and with an allowance of 20 per cent for interest, depreciation, taxes and obsolescense there is an additional cost of



The apparatus shown above consists of two 10-ton Frigidaire compressors in the Little Theatre at the Century of Progress, Chicago

AMERICAN
RENEWABLE TYPE
AIR FILTERS





CLEAN AIR
AT MINIMUM COST

American Renewable type filters are low in first cost—simply installed and easily serviced.

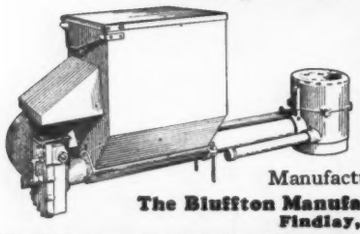
RE-NU Furnace Filter is of all-metal construction—sturdy and permanent—the ideal filter for furnace fans and home air conditioning systems. Only the filter pad is renewed—no tools needed. THROWAY Furnace Filter is of heavy cardboard construction. The whole unit is thrown away when replacement is necessary. Low in price. Highly suitable for warm air heating systems with either gravity or fan circulation, room coolers, unit heaters, etc.

"American" means a *complete* line of air filters. Send for *"Profits From Clean Air"*. It tells the whole story.

AMERICAN AIR FILTER CO., *Inc.*
. . . DUST CONTROL DIVISION . . .
113 Central Ave. Louisville, Ky.
IN CANADA, DARLING BROTHERS, LIMITED, MONTREAL, P. Q.

FINDLAY

A Dependable Line—



upon which to build a permanent and profitable business.

Domestic, Commercial and Industrial Sizes.

Manufactured by
The Bluffton Manufacturing Company
Findlay, Ohio

STOKERS

Peerless

BLOWERS -
FURNACE FANS
MOTORS & CONTROLS

UNCONDITIONALLY GUARANTEED

The Peerless *unconditional guarantee* takes *all* motor responsibility off your shoulders and satisfies *your* customer. Also complete units and parts for warm air fan and blower systems of the same high quality as motors can be supplied to the furnace manufacturer, dealer and contractor. Write for complete catalog.

THE PEERLESS ELECTRIC COMPANY, Established 1893
2500 MARKET STREET
WARREN, OHIO

Complete Engineering Service for the Asking

Thermostatic Devices

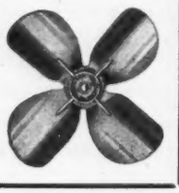
Thermostatic Devices developed to actuate relays and fractional horse-power motors, temperatures up to 600 degrees Fahrenheit.

Thermostat Department
COOPER OVEN THERMOMETER CO.
PEQUABUCK CONNECTICUT

TORRINGTON
FANS AND
BLOWER WHEELS

Patented All Aluminum Multiblade, Balanced Blower Wheels. Unexcelled for quiet and smooth operation.

32 years' experience building Propeller Fans—assembled, balanced and tested ready to mount on motor shaft.



THE TORRINGTON MFG. CO.
14 FRANKLIN ST.
TORRINGTON, CONN.

0.20×700=$140.00 which must be added to the operating charges. The distribution of costs, figured on the 1932 operation of the research residence would be:

TABLE 3

	Electric	Ice
Interest, depreciation, etc. (20%)	$140.00	....
Small power	4.65	$ 7.80
Water, sliding rate	37.20	....
Power	18.60	7.80
Repairs	25.00	....
Ice, at $4.00 per ton	.....	172.00
Total, yearly cost	225.45	187.60

In an average residence it is probable that nowhere near the care would be applied to the regulation of the cooling as was the case of the research residence. In order to get the proper slant it would be necessary to consider either that the results would not be as regular or that more ice would be used or both. The same remarks would apply to mechanical refrigeration.

Conclusions

There are three practical and successful methods of comfort cooling residences which can be made to apply to the whole house or to a room or two only. The existing warm air furnace may be used with minor detail changes to circulate the cooled air to the rooms to be conditioned. Tests indicate that there is no blanketing of cold air, no condensation of water on the risers, etc., and that a complete success with the installation is possible. The usual residence will be subject to more factors than the research residence due to the usual living conditions, such as cooking, "ventilating" the house, opening and closing the outside doors, etc.

The comfort cooled house should have average good construction with weather strips and awnings, during the cooling period, on the south, south east and south west sides. There is a decided advantage in the use of insulation particularly in the attic floor and the walls exposed to direct sunlight. The windows must be kept closed except during the night time, as the night air can be used to advantage except in periods when hot waves prevail.

Operating conditions for comfort cooling are not as definite as in heating. Usually this means some temperature near 80 deg. F. dry bulb and from 45 to 50 per cent relative humidity. Usually it can be said that most temperatures and humidities are comfortable for people in good health provided the night is comfortable and refreshing. The attempt to cool the whole house means considerable expense, which will not be justified by more than a small minority.

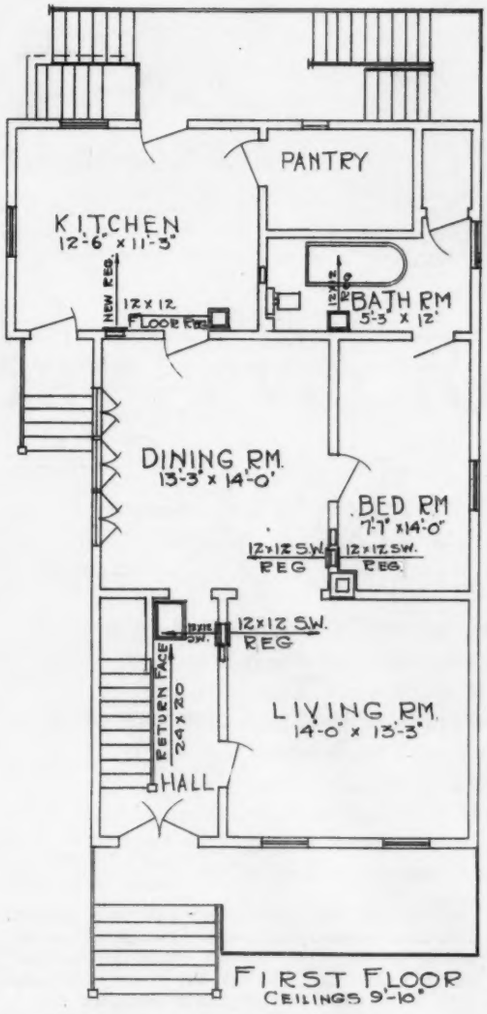
The choice of ice or mechanical refrigeration depends on local conditions. Electric refrigerating machines can be bought considerably below the prices given, if we accept certain quoted prices for the season of 1933. The author does not know how the life of these cheaper machines will compare with standard makes, but it seems very probable that the difference in the costs in the two kinds of plants, the ice cooled and the mechanical refrigerating machine, can be reduced. However, it is certain that in any case where comfort cooling is desired a careful analysis of all the cost items should be made. Unless this is done the results will not be satisfactory.

Packaged Air Conditioning

[*Continued from page 35*]

The basement seemed over-heated in the morning firing-up period, this apparent over-heating is due to the low head room.

Space will not allow a full report of the test findings but it may be of interest to note that one 6-inch run on this system at 140-degree inlet temperature, the run 10 feet long with three 90-degree elbows is equivalent to one 11½-inch gravity pipe as given in the code. No run had less than two 90-degree turns, but the writer believes that if one turn were eliminated the run would be equivalent to a 12-inch run by the Standard Code figures.



The first floor plan shows the location of the single return which serves both floors. The old registers were used except in the kitchen where a new register was installed

The entire system could be installed and a fair profit realized for the sum of $400.

The outstanding result was the low power consumption for the work accomplished. The final results depend much on the heater and the casing design. The entire system while standard to the nth degree requires

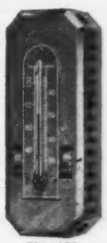
LOW PRICED REGULATOR

"GENUINE DETROIT"
No. 425
TEMPERATURE REGULATOR

LOW-PRICED low-voltage "Genuine Detroit" No. 425 Temperature Regulator provides close, accurate temperature control, reduces service calls to preserve your wide profit margin. Easily installed and requires no service. Any workman can connect the simple two-wire circuit.

"Genuine Detroit" Temperature Regulators operate noiselessly, yet with ample power to operate dampers. For night and day control, the No. 426 Regulator includes a two-blade Thermostat and an electrically operated clock switch with Telechron movement.

Write for Bulletin No. 53.


No. 455 Night and Day Thermostat

No. 456 Clock Switch

DETROIT LUBRICATOR COMPANY
Trumbull, Lincoln, Marquette & Viaduct
DETROIT, Mich., U. S. A.
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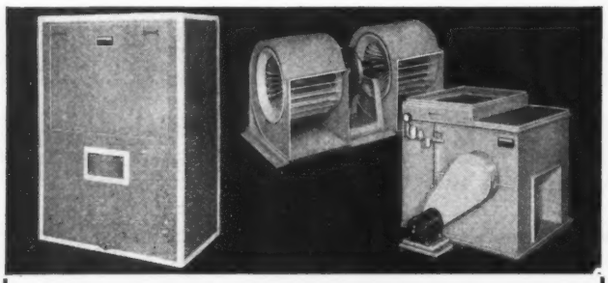
Lubricators • Carburetors • Valves
Automatic Controls for temperature, pressure, humidity
Refrigeration, Oil Burner and Heating Accessories



There's real money
for you in these fine quality

SILENTAIR

Air Conditioners

Public interest in air conditioning is intense. Why not cash in on this demand for better living conditions that is emphasized in air conditioning? Install homes and small buildings with the tested, reliable Silentair air conditioning system, the leader in the field. Make a furnace job on a new home an air conditioning job at the same time. Install Silentair in old homes too, easily. A. Gehri & Company have been manufacturing fans and ventilating equipment for 40 years. Its units are scientifically designed and tested, with types and range of prices for every need. Send for catalog and prices now.

A. GEHRI & CO.
Established 1892
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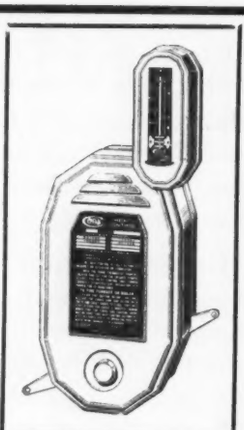
WITH EACH
cleaning,
repairing
AND
replacing
job
SELL



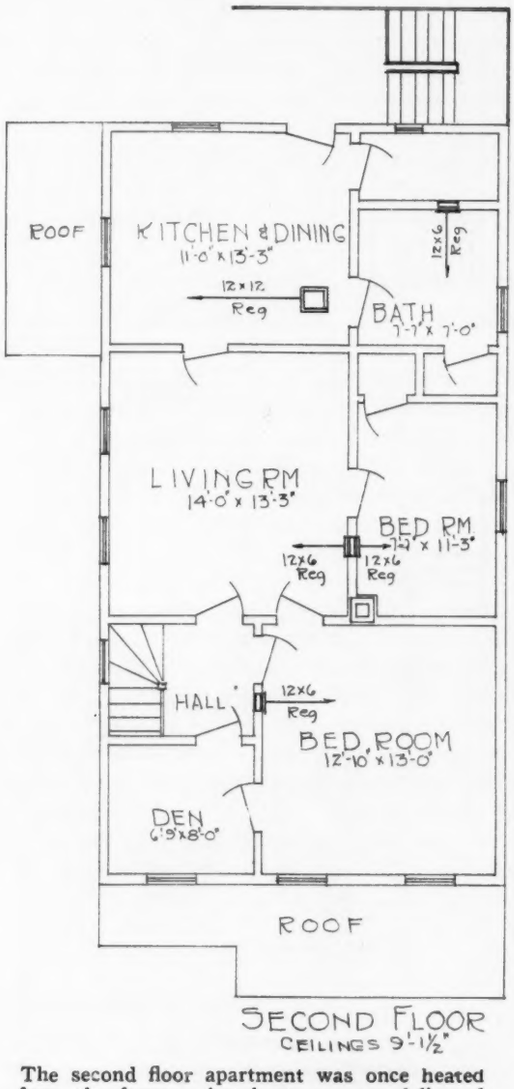
COOK HEAT CONTROL FOR
Automatic Temperature Regulation

● COMPLETE CONTROL EQUIPMENT FOR HEATING, VENTILATING AND AIR CONDITIONING » » »

COOK ELECTRIC CO.
2706 SOUTHPORT AVENUE, CHICAGO, ILLINOIS
Manufacturers
Thermostats . . . Limit Controls . . . Time Switches . . . Regulators . . . Central Control Units

good engineering and balance. The extra run was added to the first floor kitchen, for this room as will be noted, is badly exposed.

No check draft was used, and while at times the smoke pipe temperature seemed high, little or no smoke was observed at the chimney top and the thermostat seldom had an overrun of more than 2 degrees. One of the theories tested was that all the air that passed into the smoke stack should pass through the fire bed

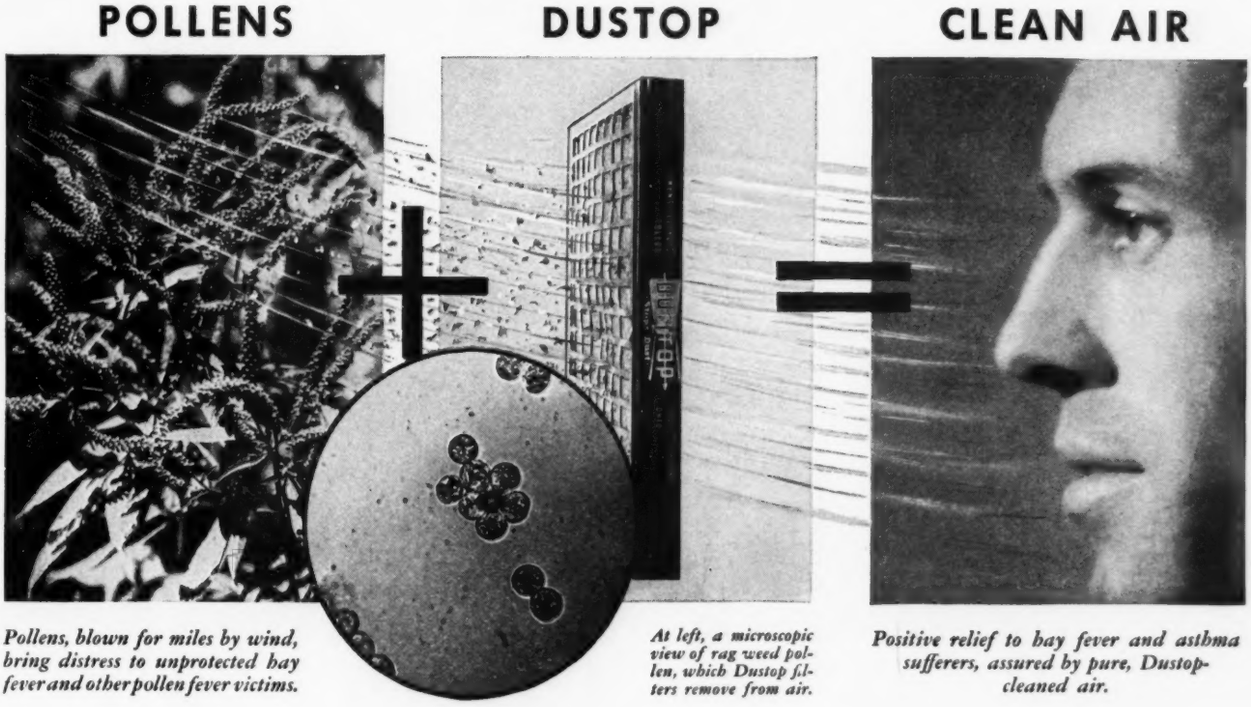


The second floor apartment was once heated from the furnace, but heat was not delivered so the stacks were cut off from the furnace and a stove used. These old stacks are now used just as originally installed

and the draft should be controlled at the ash pit door only. This requires tight joints and well ground doors.

A great deal of importance should be placed on the casing top or plenum chamber. The temperature at the various openings did not vary enough to show on the thermometer. Three types of filters were experimented with. They all had about the same pressure loss. The air volume was cut about 18 per cent with the filters in. The dirt content did not seem to alter the findings to any great extent. However, the tests were not conducted over the proper length of time to really fill the filters with dirt. However, 60 hours' ac-

(*Continued on page 54*)



Pollens, blown for miles by wind, bring distress to unprotected hay fever and other pollen fever victims.

At left, a microscopic view of rag weed pollen, which Dustop filters remove from air.

Positive relief to hay fever and asthma sufferers, assured by pure, Dustop-cleaned air.

Hay Fever Relief for Millions —Profit for YOU!

● Medical authorities have proved that hay fever victims can secure practically 24 hour-a-day relief from attack if they pass their normal home hours in a pollen-free house. Independent experiments prove that "Dustop" air filters, installed in connection with a forced air furnace system will remove approximately 99% of pollen from the air circulated in the home. By making these facts known, any furnace dealer can secure *hundreds* of profitable extra jobs installing "Dustop" in connection with fan equipped warm air furnaces. Prospects with gravity warm air furnaces, will in many cases wish to add blower equipment for better ventilation and take advantage of "Dustop" filter protection against pollen.

The "Dustop" filter is constructed of glass-wool,coated with a viscous material, and is supplied in the form of a loosely compressed mat inclosed in a fibre frame. It takes not only pollen, but dust, soot, lint and bacteria out of the air that enters the home. It requires no cleaning. Due to its low cost it can be thrown away when saturated and replaced with a new unit. You get the repeat business, too.

Plans and specifications for installation of filter boot for attachment to warm air heating plants are supplied to all "Dustop" dealers. Write today and get your share of profits from the 8 million prospects.

Owens-Illinois Glass Company, Industrial Materials Division . . . Toledo, Ohio.

OWENS-ILLINOIS

DUSTOP AIR FILTERS

1873 • SIXTIETH ANNIVERSARY • 1933

YOUR air conditioning system can be no better than the controls which govern its refrigeration, heating, humidifying or circulating functions. There are 147 different Minneapolis-Honeywell air conditioning controls. They provide the flexibility that makes it possible to use exactly the type of equipment necessary to achieve the specific results required of your system and enable it to perform with the greatest efficiency and general satisfaction. They make it unnecessary to compromise performance and results because of the limitations caused by the lack of adequate control equipment. Let the Minneapolis-Honeywell engineer in your city assist you in selecting exactly the proper controls suitable for your particular system. Then you will be sure that your equipment is always functioning as you intended it should. Minneapolis-Honeywell Regulator Company, 2726 Fourth Avenue South, Minneapolis, Minnesota. Branch offices and distributors in all principal cities.

■

MINNEAPOLIS-HONEYWELL

Control Systems

ASSOCIATION Activities

Indiana District Meeting

The second district meeting of the Sheet Metal and Warm Air Heating Contractor's Association of Indiana was held in South Bend, June 23, with an attendance of more than 75 members, guests and friends.

A delightful dinner and program was arranged by J. A. Harris, of the South Bend Spark Arrester Co., who had charge of the arrangements for the meeting. In addition, a substantial program was also presented covering several topics of importance.

Paul Jordan, state secretary, delivered a black board talk on cooling by ventilation. As might be expected, Mr. Jordan's talk was interesting and informative and drew many questions which were answered with the aid of diagrams.

A. Gustafson, of the F. & G. Company, Dowagiac, Mich., briefly discussed cooling as found in the University of Illinois report and then outlined some of the problems confronting us. He made a strong appeal for reasonable sales statements.

A topic which created much argument was the new Indiana gross income tax law which divides business men into two classes—retailer and manufacturer. Exactly which classification our contractors fall in was the question and the meeting decided that the state association should look into this and render a definite report.

The concluding discussion was brought out by J. A. Harris, who stated that every contractor ought to give full consideration to the provisions of the Industrial Recovery Act, especially those parts of the act which deal with the formation of codes of fair practice.

The South Bend District gathering at dinner

New Des Moines Association

Seven prominent heating equipment manufacturers of Des Moines, Iowa, have organized the Air Conditioning and Warm Air Heating Engineers Association of Des Moines for the specific purpose of raising the standard of air conditioning and warm air heating engineering and installation in Des Moines.

The firms represented in the new association are: Campbell Heating Company, Capital City Sheet Metal, Green Foundry & Furnace Works, Model Stove & Furnace Company, Quick Furnace & Supply Company, Van Dyck Furnace Company and Blosser Furnace & Sheet Metal Company.

A group of rules has been drawn up setting forth the purposes of the organization. Among the rules are—each member pledges himself to install gravity jobs, including replacements, according to the Standard Code; all forced air or air conditioning jobs are to be installed according to the new mechanical code.

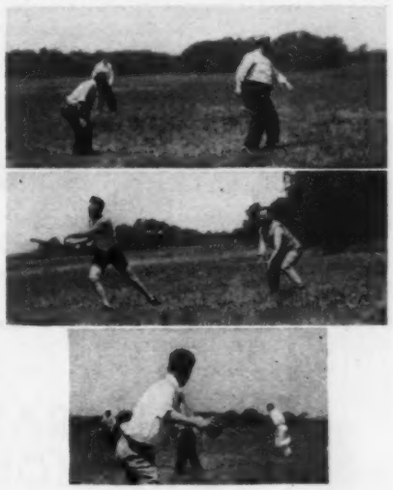
The association members agree to take out a furnace permit for all jobs so that the owner shall be protected. A committee appointed by the president inspects each job installed by members of the association to see that high standards are maintained.

A. B. Meston of the Quick Furnace & Supply Company, Des Moines, is secretary of the association.

Chicago Ass'n Picnics

On Thursday, July 20, the Furnace & Sheet Metal Institute of Chicago held its second annual picnic in Long Park, Long Lake, Ill. The weather was perfect, and the picnic grounds nicely shaded. The nearby beach was heavily patronized.

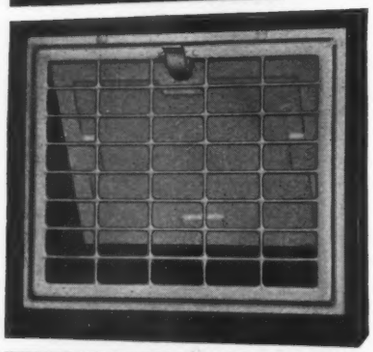
The feature of the day was the ball game between the contractors and the salesmen. For the first five innings it looked as if the contractors would walk off with the game without competition. When the salesmen went to bat in the sixth the score stood 12 to 4. But before the game was over, the salesmen had gathered in enough runs to make the final score 14 to 12 in their favor. In the sixth they went on a batting spree which put the game on ice. Jack Weiner, president of the Institute, umpired the game.



Top—Jack Weiner calls them from behind the pitcher. Middle—Walter Joy reaches for one that didn't get to him. Below—A little action at third on a hit that produced an out

Other events of the day were races for children, a fat ladies' race, a fat man's race, an Institute member's race and two open races for married men and women. Prizes were awarded the winners.

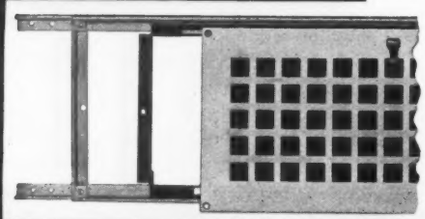
H&C More than Ever the Line on which you should STANDARDIZE



Always recognized as *the* QUALITY LINE, now supplemented with the finest Tuttle & Bailey items, H & C offers you a choice-range of fine registers that is not approached by any other line, yet they cost no more than others. Standardize on H & C. Enjoy the selling help and customer satisfaction these superior registers provide.

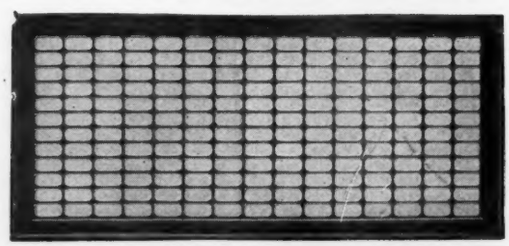
Complete stocks of all standard items are maintained for immediate shipment.

No. 902 Baseboard Register — One of seven complete lines of 1 and 2-piece baseboard registers. Sidewall registers and intakes to match.

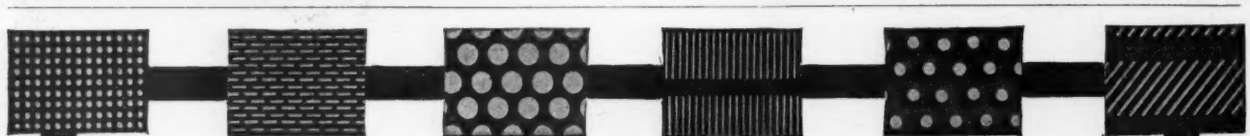


No. 3351 Forced Air Sidewall Register — Now made with extension arms of proper length to fasten directly to studding. Complete line includes 1 and 3-piece baseboard and sidewall registers furnished in choice of three attractive grille designs. Intakes to match.

HART & COOLEY MFG. CO.
General Sales Office, 61 W. Kinzie St., Chicago



No. 255 Cold Air Face
Still superior in air capacity, appearance and general utility to any pressed steel cold air face on the market. We welcome your comparison. Matches our No. 200 line of floor registers. Extremely popular in oak grain.



PERFORATED METALS

for Every Requirement in

STEEL, BRASS, BRONZE, COPPER, ZINC, TIN-PLATE, MONEL, LEAD, STAINLESS IRON, ETC.

Perforated to Your Order

Round Holes from .020″ to 7″ — Oblong and Slot Holes from .008″ to 3″ wide
Ornamental Patterns—Square Holes of Standard Sizes for

Grain Separating and Grading, Ore Sizing and Screening, Coal Screening and Washing, Pulp and Paper Mills, Sugar Refining, Grilles and Ventilators, Machine and Belt Guards, Irrigation Wells, Drying Floors, Or any other purpose

OUR ENTIRE PLANT IS DEVOTED TO PERFORATING

THE HARRINGTON & KING PERFORATING CO.

5649 FILLMORE ST., CHICAGO, ILL., U. S. A. NEW YORK OFFICE, 114 LIBERTY ST.

New PRODUCTS

New Ventilator

A ventilator and smoke cowl, said to possess unique and patented features of design and operation is being manufactured by the United States Ventilator and Power Corp., 184 Summer Street, Boston, Mass.

The new ventilator incorporates the internationally famous Savonius "S" wind rotor and a special type centrifugal fan. The Savonius rotor will be remembered as the wind rotor which drove the rotor ship which visited this country some years back.

The features of the ventilator are said to be—continuous and silent operation, no running cost, moderate price, ability to operate in wind speeds as low as two miles per hour, no resistance to air or smoke passage, and full protection from grease, smoke, dust and water.

The smoke cowl is said to prevent down draft, require no attention, has full ball bearing mountings and is proof against smoke, water and hot gas.

Complete information showing operating efficiencies, capacities, sizes and costs are presented in a leaflet which the company will mail to contractors requesting them.

The Thermochron

A new instrument by Minneapolis-Honeywell Regulator Company—the Thermochron, combines time and temperature functions to make possible the anticipation of temperature changes without the aid of artificially applied heat at the thermostat. It takes the place of the conventional room thermostat.

In operation it is radically different from a thermostat because it combines the action of time and temperature. A fraction of a degree drop in temperature causes the Thermochron to turn on the heat for a period of from one or two minutes to fifteen or twenty minutes, or continuously, depending upon the rate of heat loss from the building.

Because of its new principle of action, the Thermochron is claimed to provide heat directly in proportion to the rate and amount of heat loss; to maintain temperatures within a fraction of a degree of the setting of the pointer; and eliminate overheating, under-heating and air stratification.

Complete detailed data is available upon request.

◆

Beer Cooling Coil

This cooling coil is made of welded Monel Metal tubing of .032 thickness and one-half inch in outside diameter, and would measure 40 feet if uncoiled. Several advantages are claimed for this type of tube. Its cost is near the range of block tin coil and it combines flexibility with great strength and resistance to wear and abrasion. Large cakes of ice can be dropped on it without damage and it can not be harmed by the slipping of the ice pick. It also eliminates the need of a guard or other protecting device required by softer materials. This new coil in a variety of sizes is being placed on the market by the Metal Forming Company of Elkhart, Ind.

◆

Insulating Materials

Two new insulating materials—a rock wool blanket and a cement—are announced by the Standard Lime and Stone Company, Baltimore, Maryland. The products will be marketed under the trade name—Capitol Rock Wool.

The blanket is said to be suitable for insulating furnace casings, air ducts, breechings, tanks and pipes of all kinds and for quieting machinery.

Complete information on prices, covering capacities, insulating properties and application has been incorporated in leaflets which the company will mail.

◆

Oil-Heat-Resisting Cable

A new cable insulated with Glyptal-treated cloth and capable of resisting oil and withstanding high temperatures has been developd by the General Electric Company, and is now available in all types. In addition to its ability to resist oil and heat, this new cable possesses flexibility and toughness to stand severe mechanical strain.

Cable insulated with Glyptal-treated cloth can be used advantageously for low- and medium-voltage leads, apparatus cable, transformer leads, leads for coils and control devices, or wherever an oil-resisting, heat-resisting cable is required.

◆

Forced Air Registers

A new line of forced air, wall type, registers to be distributed under the trade name "Syox" is announced by the Symonds Register Company, St. Louis.

A bulletin describing and showing the new line of registers has been prepared and will be mailed to contractors. This bulletin shows the proper installation, gives complete information on sizes of diffusers and prices and contains a brief description of the function of this new diffusing register.

"ME?

I've Learned How to Take My Profit!"

"I USED to think I could use cheap metals and still hold my customers . . . I also thought my work was so well known that I didn't need to keep telling people about it. But I've learned different! I've taken up the money-losing slack; I use easy-working, rust-resisting INGOT IRON on all my jobs. And what's more, I never let up telling prospects and customers about my skill and good materials, my ability to satisfy and save them money. Armco helps by supplying the right sheet metal and all sorts of dealer-aids and suggestions to promote the selling. You bet! I've learned how to take my profit. You can, too—the same way. Write them—they'll show you just how."

THE AMERICAN ROLLING MILL CO.

***Executive Offices*: Middletown, Ohio**

There's an Armco Distributor Near You

ARMCO **SHEET METALS** *Create Profits* **out of Customer-Satisfaction**

Every month "Ingot Iron Shop News," offers you ideas and suggestions on how to increase sales, cut costs, and turn out work that satisfies customers. Published for ambitious contractors by the Armco Distributors' Association. Write for your free subscription.

With Our Readers . . . . . .

Model Air Conditioning House

W. R. Etie, 1901 Houston Ave., Houston, Texas, has for several years used the model house shown in the illustration at conventions and in displays to show the type of heating work he is prepared to do.

Mr. Etie has used the house so many times that he feels it has lost some of its popularity and he is willing to enter into correspondence with any contractor able to use such a house relative to the disposal of the house.

Mr. Etie reports that the house has been used during three seasons in Houston and that it has given him the cheapest and best advertising value of any plan used by his firm.

The house shows a heating and ventilating system, a properly applied metal roof, shows flues, caps, gutters, downspouts, exhaust hoods, and other forms of metal application.

Anyone interested in a house of this kind can get in touch with Mr. Etie in Houston.

◆

St. Joseph Shop Moves

The St. Joseph Sheet Metal Works, St. Joseph, Mo., Warner J. Smith, manager, doing a general furnace heating and sheet metal business, would like to have copies of catalogs and literature furnished to contractors by manufacturers. Discount sheets are also requested. The new address is 917 North 19th St., St. Joseph, Mo.

◆

New Shop for Brooklyn

Louis Rothstein and Elias Thaw have opened the Borough Roofing and Sheet Metal Works Company at 586 Rogers Avenue, Brooklyn, New York. All lines of sheet metal and roofing will be done.

◆

Lennox Retail Outlet

The Lennox Furnace Company, Marshalltown, Ia., has appointed the Marshalltown Sheet Metal Works as the retail outlet in Marshall County for the company's line of furnaces and air conditioning equipment.

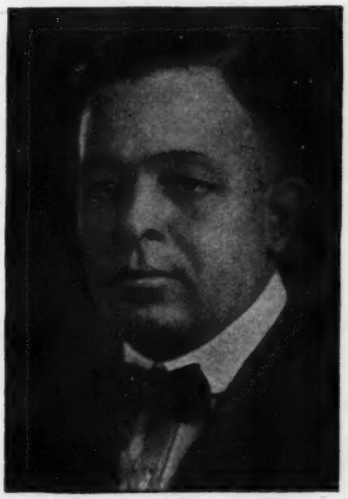
News Items . . . . . .

J. C. Miles Joins Henry Furnace and Foundry Co.

Of widespread interest to the warm air heating industry is the announcement that J. C. Miles, inventor of the Miles automatic furnace fan, and the Henry Furnace and Foundry Company, Cleveland, have joined forces with the intention of introducing to the trade a new line of forced air and conditioning equipment.

A new division of the Henry company has been established to be known as the Miles Furnace Fan Division of the Henry Furnace and Foundry Co. The new division has brought out as its first product the Miles Junior air conditioner which contains in one housing a Miles blower with by-pass louvres, filters, controls and a fan boot. This conditioner may be attached to any furnace and is designed and priced to give the home owner the major benefits of conditioning at a low price. Additional items are planned for introduction.

This alliance brings together two producers of heating apparatus each favorably and well known to the trade. The Henry company has long enjoyed recognition as a producer of excellent furnaces and operates one of the most



efficient and highly mechanized foundrys in the country. In addition, the company has one of the largest sheet fabricating shops in the middle west. The full value of this up-to-date organization will thus be placed behind the new division.

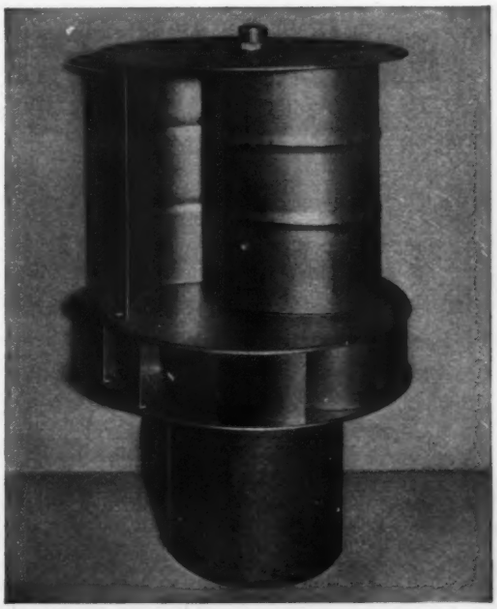
J. C. Miles needs no introduction. He was among the first to talk forced air heating and to his untiring efforts, his talks before groups of dealers, his early experimentation, is due much of the initial and present progress made in fan work.

This uniting of the manufacturing and distributing facilities of the Henry company with the technical ability and favorable standing of J. C. Miles should redound to the prestige of both and the advancement of the industry.

◆

Fox Furnace Moves Philadelphia Office

Effective July 12, 1933 the Fox Furnace Company's Philadelphia sales office for air conditioning equipment was moved to the Bonbright Building, 1520 Locust Street.



The "S" ROTOR VENTILATOR and SMOKE-COWL incorporates the internationally famous Savonius "S" Wind Rotor and a special type centrifugal fan. In actual service this unit has proven vastly more efficient than any other representative type.

"S"

ROTOR VENTILATOR

and

SMOKE COWL

The Solution to all Ventilating and Draft Problems

The "S" ROTOR VENTILATOR offers, for the first time, a power ventilator more thoroughly competent than any other wind driven device serving in a similar capacity.

It is no longer necessary for you to stake your reputation on less efficient ventilators. No longer do you need to install a product of questionable merit and ability. You may recommend the "S" ROTOR VENTILATOR with the conviction that it *can not* fail.

No great effort need be exerted in selling this unit—it practically sells itself. Features, characteristic of the "S" ROTOR VENTILATOR include: Low first cost. . . No maintenance expense. . . Sensitive, frictionless suspension. . . Ball Bearing mounted, grease packed, damp, dust, smoke and water proof. . . Operates in air speeds under two miles per hour. . . Constant, silent in operation. . . May be substituted, in some cases, for electrically operated units. . . Impervious to heat, cold, rain, snow, sleet, smoke, dust, steam or gases.

"S" ROTOR SMOKE COWLS are unequalled for increasing draft. The action is positive and back drafts are impossible. Once installed they require no more attention.

There is a large market right in your own community for "S" ROTOR VENTILATORS and SMOKE-COWLS. Be among the first to handle these profit-builders. . . Write today for full information.

UNITED STATES VENTILATOR AND POWER CORPORATION

Sole U. S. Licensee ***Savonius Patents***

184 SUMMER STREET BOSTON, MASS.

THE VIKING SHEAR
AN AID TO THE
PROFITS
OF
EXHAUST FAN
INSTALLATIONS

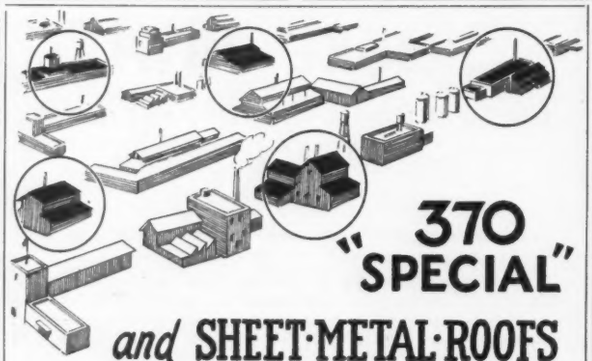
ARE you getting your share of exhaust fan installations? Have you a special plan for building up exhaust fan business?

There's profit a-plenty in this kind of work. Your prospects are many and can be encouraged by your story of successful installations. One job aids another.

Viking Shears will be an aid to you in securing this kind of business. And why? Well, Viking Shears cut your labor costs, for one reason. They enable you to cut and trim quickly and accurately. And not only on one job either. They continue to stand up remarkably, working day in and day out.

Viking Shears must be part of your equipment if you want to get the most work out of your tools.

VIKING SHEAR CO., ERIE, PA.



370 "SPECIAL"
and SHEET-METAL-ROOFS

LOOK down upon the roofs in your community. Single out those roofs that are sheet metal and then make it your business to do the painting job.

And keep this in mind—*sheet metal roofs must be painted regularly in order that they continue to protect the buildings they cover.* Sheet metal roof painting is business that is constant and profitable.

With the fact that roofs must be painted regularly already established, the question that is important to you is, which paint to use, to do the job most satisfactorily and economically.

We suggest 370 "SPECIAL RED." Here is a paint, the ingredients of which, assure long life and protection and which is being recognized among buyers as an exclusive standard where quality is essential but where economy is stressed.

Other Thompson Products—Alumbrite—the new Aluminum Paint for Wood and Steel and Lin-O-Jap, the Perfect Reducing Oil for All Paint.

THOMPSON & COMPANY
P. O. Box 557, N. S. PITTSBURGH, PA.

News Items . . . . . .

Air Controls Buys Warm Air Furnace Fan

Air Controls, Inc., Cleveland, Ohio, division of The Cleveland Heater Company, manufacturers of domestic water heaters, announce the purchase of The Warm Air Furnace Fan Company.

The new organization, under the direction of A. M. Apmann of The Cleveland Heater Company, and Marion I. Levy, formerly with the Bishop & Babcock Sales Company, will continue the manufacture of fans and blowers for warm air heating.

The Fans and Blowers manufactured by the above company, will feature Air Controls, the automatic louvres on either side of the blower. These louvres open automatically when the fan is stopped, permitting unrestricted gravity flow. When the fan is started for forced circulation, the louvres shut, preventing back flow around the edges of the fan, thus retaining the full efficiency of the fan.

Automatic Furnace Fans are available in eleven sizes and in twelve sizes for public building and industrial applications. The blowers can be had in three sizes, with selective speeds for intermediate capacities, and especially designed for quiet operation against resistance.

Bulletins of the Company's products are available and will be sent gladly upon request.

◆

Draft-A-Justor Sold

The Draft-A-Justor Corporation of Chicago has been purchased by Preferred Utilities Company, New York. In the future, all Draft-A-Justor business will be handled from the New York office. Several changes in the selling personnel will be announced later.

◆

Frigidaire in Air Conditioning

Entrance of Frigidaire Corporation, subsidiary of General Motors, into the field of heavy duty air conditioning equipment is announced by E. G. Biechler, President and General Manager.

The company is introducing nationally large capacity equipment designed to handle the air conditioning loads required for theaters, office buildings, apartment buildings, retail commercial establishments, large residences and individual industrial applications.

Large store units have been put into production along with compressors with ten tons refrigeration capacity. The largest unit built by the company previously has been one with three tons capacity.

News Items . . . . . .

"Dustop" Filter on Display Card

Making the actual product a part of the "Authorized Distributor" sign is an idea developed by the Owens-Illinois Glass Company, Toledo, Ohio, to assist its distributors in making more sales of the "Dustop" glass-wool air filter.

The light weight of the 2-pound filter makes this plan practical. The display card therefore serves not only to designate the authorized distributor but gives him at the same time an actual sample of the product to display in a conspicuous place.

All authorized "Dustop" distributors are given one of these display cards to which they can easily attach a fresh clean filter.

◆

Goodrich to Distribute Miller Mallets

The B. F. Goodrich Rubber Co., Akron, Ohio, announces that their distributors will, in the future, handle Miller composition mallets.

This mallet, especially designed for sheet metal workers, has a fibre and rubber composition head and can be obtained in several weights and lengths of handle.

Full information can be obtained from the Goodrich Co., or from any one of their distributors.

◆

American Air Filter Changes

F. H. Mason, manager furnace filter division, American Air Filter Co., has discontinued the Cleveland office and in the future will be located at the plant of the American Air Filter Co., 101 Central Avenue, Louisville, Ky.

◆

Wilson Manager Ryerson St. Louis Plant

R. B. Wilson, Sales Manager of the St. Louis Plant of Joseph T. Ryerson & Son, Inc., has been made manager of the St. Louis plant of that company.

◆

Cincinnati Sheet Metal & Roofing Co. Buys Christie Cleaner

Announcement is made of the purchase by the Cincinnati Sheet Metal & Roofing Co., 230 East Front Street, Cincinnati, of the Christie Cleaner Co. The Christie Cleaner Co. now forms a division of the Cincinnati Sheet Metal & Roofing Co.

The Cincinnati Company is an old established manufacturer and jobber of sheet metal and sheet metal products. This line of Ajax furnace fittings and accessories have been known to the trade for many years. The company is also a jobber of cast and steel furnaces.

The company announces that a complete sales and advertising plan for the use of the furnace dealer has been prepared and information on the plan can be obtained from the company. Price reductions are also announced for the equipment.

An Open Letter to President Roosevelt:

Mr. President:

Appreciating that you are right, and that the only way our National Recovery can be made actual, we hereby assure you that we, as a manufacturing firm, will co-operate in every way to promote your recovery plans in our industry and through our dealers and employes.

Very truly,
F. MEYER & BRO. CO.,
Peoria, Illinois.

An Open Letter To Our Dealers:

Gentlemen:

There can be no dodging the fact that costs and prices of merchandise — HANDY PIPE, INCLUDED — must advance from present levels. We suggest that it is plain common sense to stock up as far as possible, in anticipation of your fall needs, AT ONCE. We can fill orders immediately upon receipt.

Very truly,
F. MEYER & BRO. CO.,
Peoria, Illinois.

(The "Handy Pipe" People)

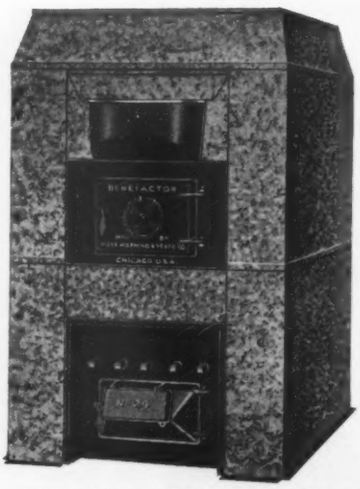
EASIER TO SELL

HESS HEATING AND AIR CONDITIONING EQUIPMENT IS

◆ DISTINCTIVELY DIFFERENT ◆

BENEFACTOR FURNACE

QUALITY WELDED STEEL—LOW PRICED
AIR CONDITIONER—BLOWER-FILTER UNIT
INCREASES DEALER PROFITS



◆

See HESS Exhibit at Home Planning Hall—World's Fair. Write Today for Dealer Portfolio Describing Complete HESS Line

◆

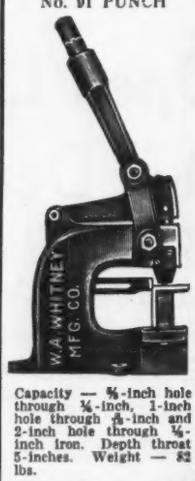
HESS WARMING & VENTILATING CO.
1201-1211 S. WESTERN AVE. CHICAGO, ILL.
ESTABLISHED OVER 50 YEARS

WHITNEY LEVER PUNCHES

No. 4B PUNCH

Length—8½ inches. Capacity ¼-inch through 16 gauge. Deep Throat—2 inches. Weight—3 pounds. Punches and Dies—⅛" to ⅜" by 64ths.

No. 91 PUNCH

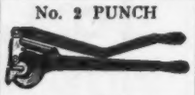


Capacity — ⅝-inch hole through ¼-inch, 1-inch hole through ⅜-inch and 2-inch hole through ⅛-inch iron. Depth throat 5-inches. Weight — 82 lbs.

No. 1 PUNCH

Length — 34 inches. Capacity — ⅝-inch hole through ¼-inch iron. Punches and dies in sizes from ⅛ to ⅞ by 64ths.

No. 2 PUNCH



Length — 23 inches. Capacity — ⅜-inch hole through ⅛-inch iron. Punches and dies in sizes ⅜-inch to ⅝-inch by 64ths.

No. 6 PUNCH

Length — 26½ inches. Capacity — ¼-inch hole through ⅜-inch iron; especially adapted for button punching or templet work. Punches and dies ⅛" to ⅜" by 32nds.

We have tools for every purpose needed by Sheet Metal Contractors.

Ask your Jobber

CHANNEL IRON PUNCH

Companion to No. 2 Punch. Every part of the two Punches interchangeable, including punches and dies. Capacity — ¼-inch hole through ¼-inch iron.

W. A. WHITNEY MFG. CO.
636 RACE ST. ROCKFORD, ILL.

New Literature . . . .

World's Largest Fountain

Most visitors at the Century of Progress have stopped in for a refreshing pause at the Marine Fountain—the world's longest soda fountain—where beer is served as well as all cold and soft drinks. This fountain has as a back wall for its 120 foot length an aquarium where hundreds of fishes disport themselves.

Practically all of the trim of the Marine Fountain is of IngOclad stainless clad steel, produced by the Ingersoll Steel and Disc Co., a division of the Borg-Warner Corp., Chicago. The application of IngOclad includes counter edging, foot rests, kick plates, stool trim, stool

standards, splash boards behind the fountain, back bars, back bar doors, sink tops and drain boards, shelving, cutlery bins and trays and serving table tops.

The material used (IngOclad) has a stainless steel surface to which is bonded a foundation of mild steel.

◆

Liberty Foundry Buys Langenberg Co.

William T. Mellow, vice president of the Liberty Foundry Co., 7600 Vulcan Street, St. Louis, announces the purchase of the assets including good will, business and machinery of the Langenberg Manufacturing Co.

The purchase does not include the old Langenberg plant.

Liberty Foundry Co., will move the machinery to its factory. The Liberty company will continue to manufacture the Front Rank steel furnace which has been made by the Langenberg Co. for some forty-seven years.

◆

Packaged Air Conditioning

(*Continued from page* 44)

cumulation of dirt was astonishing.

The elbow from the fan to the furnace was not ideal for test purposes, but the velocity pressure over the area of 13 by 15 inches, was fairly uniform. The readings were taken in 9 squares of 5 inches by 4⅓ inches each. The velocity pressure reading gave a velocity of 710 f.p.m. or 960 c.f.m. with the filters in. The fan delivered this volume against a total pressure of .105 inches. The delivery at the inlets was about 12 per cent more at 142 degrees.

Several of these systems have been installed in the Chicago area, but they were placed late in the season and no tests made. The air deliveries at the inlets, however, are in accordance with the above test findings.

News Items . . . . . .

Air Filter Manufacturers Organize

The leading concerns engaged in the business of manufacturing air filters of various kinds met at Detroit during the June sessions of the National Association of Heating & Ventilating Engineers. An association bearing the National Association of Air Filter Manufacturers name was organized and the following officers elected for the ensuing year: President, J. L. Harpham, Independent Air Filter Co.; Vice-President, J. S. Irvine, Owens-Illinois Glass Co.; Secretary, J. R. McConnell, American Air Filter Co.

The principal matter discussed was the Industrial Recovery Act. A tentative Code was adopted and preliminary steps taken to comply in every way with the requirements of the Act.

◆

Hess Exhibit at Century of Progress

Among the exhibits at Chicago's Century of Progress, that of the Hess Warming and Ventilating Company is receiving favorable attention. This company exhibits their new Air Conditioning Furnace, combining furnace and air conditioner as one complete unit, all dressed in an attractive green and black crinkle enamel finish casing. This is in addition to displaying other Hess Furnaces with rectangular galvanized casings.

A feature of the exhibit is the large glass bottle, over 5 feet in height and 20 inches in diameter at the base, to

illustrate their slogan "HESS FURNACE TIGHT AS A BOTTLE." This bottle contains colored glass pieces arranged about a foot in depth with colored and moving lights giving an effect of a hot fire within the bottle.

Mr. Hess says, "The great interest, indicated by thousands of people stopping at the exhibit, is proof that home owners have a great interest in air conditioning equipment for homes. People from almost every state have already visited this exhibit. This is good assurance that air conditioning for homes will receive tremendous advertising and publicity during the five months of the fair, which will be of immeasureable value to all in the business including, especially, furnace dealers everywhere who take advantage of present opportunities."

◆

Rawlplug at World's Fair

In the Industrial Engineering Section in the General Exhibition Building in the Century of Progress Exposition at Chicago is the exhibit by The Rawlplug Company, Inc., New York City.

Repair Cracked Plaster Ceilings with *Canton Steel Ceilings*

SUGGEST Canton Steel Ceilings for repair work in homes in your territory where leaky radiators during the winter or rainy weather in the spring have been the cause of cracked and fallen plaster, with its attendant damage and expense.

Steel Ceilings are readily accepted by those of your customers who have suffered inconvenience and expense from plaster ceilings.

Canton Steel Ceilings are sold through leading sheet metal jobbers in the United States.

CANTON STEEL CEILING CO., CANTON, OHIO

Buy Your Furnace Cleaner Like You Would Choose A Partner

The Super weighs only 54 lbs. — cleans 'em hot or cold —pulls 150 cubic feet of air, at speed of two miles, per minute— motor is ½ h.p. plus— operates off any outlet, no big fuses— only a little fine dust gets to the bag, all else trapped in metal container — empties like a coal scuttle.

HOW much work can it do—how quickly does it do the job—how thoroughly—how long will it last—what does it cost to operate—does it have to be coddled and helped—these are questions that you should ask any furnace cleaner that seeks a place in your organization.

The Super will tell you it is good and will prove it by working for you for 3 days on free trial. Judge it on its record with you. We assume all risk of accident. Why not have a Super sent to you for free trial in your own hands?

The National Super Service Company
1944 N. 13th St. Toledo, Ohio

The Life of

BEER FAUCETS

Depends on Who Made Them

The *working parts* of a bar are too important to be trifled with. Quality may not be at a premium right now, in the general rush for equipment, but it will show up over a period of time. Years of experience in producing fine faucets qualifies Central to furnish you the best in beer fittings. Central Beer Faucets are standard equipment for many prominent bar builders. Sold through manufacturers and jobbers.

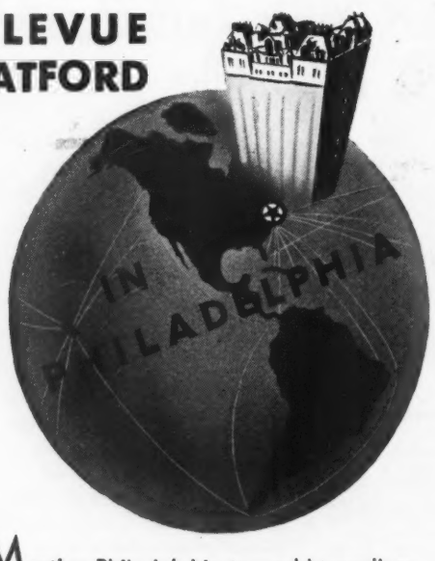
The complete Central line of Beer Faucets, Water Faucets, Taps, and other Bar Fittings is shown in Catalog C. Write for it.

THE CENTRAL BRASS MFG. Co.
2953 East 55th St., Cleveland, Ohio

CENTRAL

•Quality Fittings•

BELLEVUE STRATFORD



Mention Philadelphia to world travellers and they'll say—"Bellevue-Stratford". This famous hotel has always attracted those who appreciate the finer things of life; those whose experience has taught them where to find facilities, comforts and services in the fullest measure.

CLAUDE H. BENNETT, *Gen'l Mgr.*

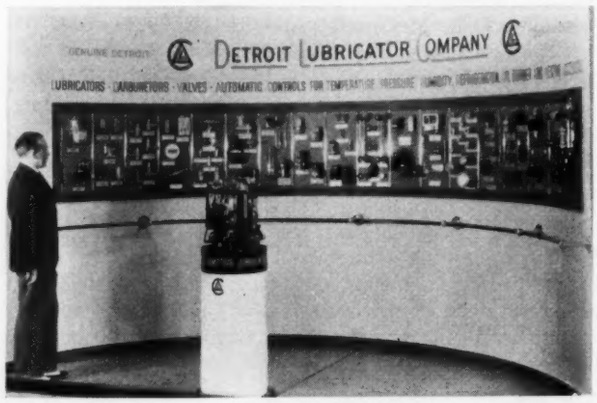
Rates consistent with present times.

News Items . . . . . .

Detroit Lubricator at the Fair

The Detroit Lubricator Co., Detroit, Michigan, has a very comprehensive display in the exhibit of the American Radiator & Standard Sanitary Co. at the Century of Progress Fair.

Among the new items and equipment shown are control devices for refrigeration, oil burners and the general



heating industry. Zone control equipment for home air conditioning systems is one of the featured groups of apparatus displayed.

Contractors are invited to visit the display and ask questions.

◆

John C. Kriedt Co. Personnel Change

The John C. Kreidt Co., 517 Ewing Street, Fort Wayne, Ind., announces that the company is now under the direction and management of C. W. Miller and David Cox.

This change in personnel was made May 1 but was not announced until recently.

◆

Aluminum Beer Barrel

Twenty-one pounds of aluminum beer barrel and fifty-five pounds of boy form the interesting combination shown here. The container is of the half-barrel size, holding 15½ gallons. It is 22 inches long and about 17 inches in diameter.

Rigid tests conducted have demonstrated the ability of aluminum beer barrels to stand all manner of rough service. Furthermore, beer in aluminum barrels retains its original color and taste. Brewers like them because they are much lighter in weight than ordinary barrels, saving time and energy and transportation costs. Pitching and painting are unnecessary and liners are not needed.

News Items . . . . . .

R. J. Schwab Sons Co.

R. J. Schwab Sons Co., is the new name for the former firm R. J. Schwab & Sons Co., Milwaukee. The address of the new firm is 605 South First Street, Milwaukee.

Associated with the Schwab's is W. J. Beauchamp, who is in charge of heating problems and heating sales work. Several new sales items have been taken over by the company and are now being distributed.

The company has a new catalog which they will be glad to mail to contractors.

◆

New Cleveland Firm

M. Gutthoff has established a sheet metal and furnace business at 8930 Hough Avenue, Cleveland.

The new firm will do a general line of heating and sheet metal work.

◆

What Carnegie Course Includes

At the Detroit Conference of the sheet metal contractors last December, the educational committee made a report regarding the instruction being offered at the Carnegie Institute of Technology for the school year 1933-1934. As a result inquiries have been received which suggest that further information, such as follows, will be of interest:

The one-year intensive course being offered covers uses of various machines and tools; practice in the processes of seaming, wiring, cutting and forming, and the operation of the various machines used in constructing the problems; pattern drafting; developing patterns for tapering forms; parallel line developments; method of laying out and constructing; lectures on materials.

Forming moldings on both hand and power brakes; drawing full size details; developing the patterns and constructing various items.

Skylights cover development of patterns, and construction of a flat skylight, gable skylight and hipped skylight; skylight with ventilating ridge and louvre base, mensuration in skylight work for finding true lengths of bars, reinforcing bars, rules for ordering skylight glass. Constructing various curbs and bars.

Estimating covers trade customs, elements of cost, finding cost of overhead expense, etc.

A special course in warm air heating covers estimating heating requirements for buildings, selection of proper size and type of furnace, location and size of leaders, stacks, and warm and cold air registers for both gravity and fan systems, properties of air, humidity, design and layout of warm air systems for residences.

Welding includes varied shop practice. Drawing includes design and details of cornice work, skylights, metal doors and trim.

Principles of double-entry bookkeeping; principles of accounting as applied to production; accumulation and recording of prime cost data and allocation of indirect expense by the various methods in common use.

The course is open to any young man who has had an education equivalent to that of high school. He should be not less than nineteen years of age. No entrance examinations are required, but a statement of his education and experience must be submitted.

Complete information on tuition costs, living costs and other matters may be obtained from A. C. Jewett, Carnegie Institute of Technology,. Schenley Park, Pittsburgh, Pa.

BEER
Fittings

Air Distributors
Bar Faucets
Brass Bungs with Check Valve
Bung Wrenches
Brass Air Cocks
Draught Tubes for Half Barrel
Draught Tubes for Whole Barrel
Draught Tube Cocks with Wing Union Nut and Hose Nipple
Register Cocks with Hex Nut and Hose Nipple
Angle Beer Nipples
Tee Fittings for 5/16" Hose
Unions
Faucet Couplings
"Y" Branches
Rod Elbows
Washout Nipples
Box Connections—2", 3", 4"

Write for illustrated folder giving TYPES, SIZES, etc.

We distribute through Plumbing Jobbers and Wholesalers

KITSON CO.
WESTMORELAND & STOKLEY STS.
PHILADELPHIA PA.

BEER
Dispensing Equipment

THE *COMPLETE* LINE

Quick Opening Bar Faucets
Draught Tubes and Tapping Bungs
Couplings for Faucets and Tubes
Distributing Pipes
Regular Brass Air Cocks
Water Stop Cocks
Connections
Overflows and Sockets
Tank Fittings
Ice Box Couplings
Brass Gauge and Regulator Arms
Beer Pipe Cleaner Couplings
Beer Pipe Cleaners

FOR the sheet metal worker who is taking advantage of the profits now available thru the beer business, here is a line of beer dispensing equipment that will fill every demand.

81 years of experience go into this line which presents immediate profit opportunities.

THE FARNAN BRASS WORKS CO.
Manufacturers of High Grade Brass Products
Established in 1852
1104 Center St., N. W., Cleveland, Ohio

Sell Furnace Repairs and Make Money

with Breuer's Ball Bearing

TORNADO

Furnace Cleaning Service

The TORNADO gets you into the basement where it is easy to sell repairs and new furnaces. And you make a profit on the cleaning job too. Hundreds of dealers say the TORNADO increased business beyond all expectations. We'll send you on request the name and statement of a dealer near you to prove our claims.

The TORNADO is the most powerful portable furnace cleaner built. Complete with 10 necessary attachments. Low price—easy payments—free trial. Approved by Anthracite Institute and Underwriters' Laboratories. Write for complete information on a real money maker.

Breuer Electric Mfg. Co.
865 Blackhawk Street, Chicago, Ill.

BEER FAUCETS

for immediate delivery

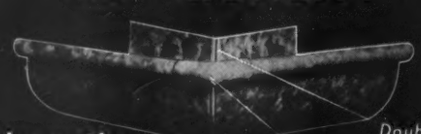
THE GLOBE BRASS MFG. CO.
2925 E. 55th St. CLEVELAND, OHIO

The
ALLEN
MULTI VANE
TURBINE VENTILATOR

Exclusive inner Multi-Vane construction assures unparalleled results.

THE ALLEN CORPORATION
1036 14th Street
DETROIT, MICH.

"BB" QUALITY



Double Seam
Reinforced Corner

Quaker City Mitre

WRITE FOR "BB" CATALOGUE
Order from your jobber

Mitres, conductor pipe, hangers, eaves trough, caps, outlets, pipe hooks and fasteners

BERGER BROTHERS CO.
229-237 ARCH STREET, PHILADELPHIA, PA.

New Literature . . . .

New Moncrief Literature

The Henry Furnace & Foundry Co., Cleveland, Ohio, will mail to interested contractors a new series of leaflets describing the Moncrief air conditioning units.

The new leaflets are made up in such a way that leaflets describing the equipment, together with a specification sheet for the units, plus an illustrated testimonial folder, are mailed in a colored folder which explains the need for air conditioning in residences and how satisfactory conditions may be obtained by using Moncrief equipment.

The leaflets describe the cast and steel furnaces and explain how the furnaces may be adapted to form a conditioning unit. Another leaflet describes the company's gas furnace.

Some very interesting data which can be shown to the prospect to point out the need for cleaning, circulating and automatic control is contained in the general folder.

◆

Air Conditioning Booklet

The Gar Wood Boiler Division of the Wood Hydraulic Hoist & Body Co., Detroit, Mich., has published an elaborate booklet on air conditioning as supplied by the new Gar Wood oil burning furnace and condition. Contractors may secure copies of the booklet by writing the company.

Elaborate illustrations are used throughout the text which explains the necessity and means for obtaining satisfactory interior conditions with additional chapters showing typical installations. Considerable information on the design, operation and installation of the Gar Wood conditioner are also included.

The last part of the book shows typical structures heated with the units and contains testimonials on the satisfactory operation of the equipment.

◆

Heat Service Plans

The Committee of Ten, Coal and Heating Industries, 307 North Michigan Avenue, Chicago, have issued Miscellaneous Report No. 7 entitled "Heat Service Plans."

This booklet consists of a compilation secured from heating and fuel dealers in every state of the union outlining the service plans which they are using.

These service plans include the satisfactory sale of fuel, the sale and service of stokers, furnace cleaning operations and other lines of activity commonly engaged in.

The booklet sells for twenty cents and may be secured by addressing the Committee of Ten.

◆

U. S. Metal Buys Great Western Steel Co.

Announcement is made of the purchase by the U. S. Metal Products Co. of the Great Western Steel Co., Chicago, Illinois, effective July 1, 1933.

The corporate name becomes Great Western Steel Co. and the personnel of both companies will be retained.

The address of the company is 2300 West 58th Street, Chicago.

◆

Excelsior Furnace Co. Price Increased

The Excelsior Steel Furnace Co., Chicago, announce that a ten per cent increase in the price of certain items in the furnace pipe and fittings line have been made due to the increased cost of raw material.

A revised price list is being prepared and will be distributed shortly.

New Literature . . . .

Refrigeration Insulation Booklets

A series of booklets describing "Linofelt," "Fibrofelt" and "Lith," a series of insulation materials manufactured by the Union Fibre Company, Inc., Winona, Minn., can be secured by addressing the company.

The company also manufactures "Linoboard" and "Limestone Rock Wool."

The company states that all of these insulation materials can be satisfactorily used in beer coolers, ice or ice water storage compartments and similar forms of cooling chambers. Each of the materials is manufactured in a number of thicknesses and weights suitable for different applications.

◆

Torrid Zone Conditioning Unit

The Lennox Furnace Company, Inc., Marshalltown, Ia., have issued bulletins H-2 and H-3 and a special four-page folder describing recent developments in the company's "Aire-Flo" conditioning unit.

Bulletin H-2 describes and illustrates the unit's features with photographs and drawings.

In addition there is also data on humidity, its control and supply; forced circulation; cleaning; air distribution; and application of equipment to particular problems.

Bulletin H-3 covers the company's new insulated blowers which consist of a single wheel blower with belt drive motor and four sections of filter, all housed in a unit.

Copies of these bulletins can be obtained from the Lennox Company.

◆

American Brass Booklet

The American Brass Co., Waterbury, Conn., have issued a new booklet entitled "Waterproofing and Dampproofing with Electro Sheet Copper."

The booklet explains how electro sheets can be applied to footings, floors and foundation walls as an exterior waterproofing eliminating the need for waterproof coatings ordinarily applied.

The booklet also explains the use of this new sheet for damp-proofing floors, exterior walls, roofs and other parts of the structure. The explanations are accompanied by comprehensive drawings showing the recommended methods of application, sheet joining, etc.

Copies of the booklet can be obtained by addressing the company in Waterbury.

◆

General Electric Motor Leaflet

General Electric Co., Schenectady, New York, have prepared a small leaflet covering the company's line of fractional horsepower, gear-type motors.

The leaflet shows the general design, construction and method of operation for the several motors included in this classification.

Contractors may secure a copy of the leaflet by writing to General Electric Company.

◆

New Zinc Price List

The Matthiessen & Hegeler Zinc Co., La Salle, Ill., announce, effective July 12, a revised price list on sheet and ribbon zinc.

Copies of the price list may be obtained by writing the company.

For Registers Specify WATERLOO

and provide concealed outlets

Illustrated Catalogue on Request

THE WATERLOO REGISTER CO., Waterloo, Ia.
Also 2211 First Ave. Seattle, Wash.

DIFFUSER

FURNACE & BOILER REPAIRS

GRATE BARS AND RESTS, FIRE POTS, FEED SECTIONS, FIRE BRICK, ETC.

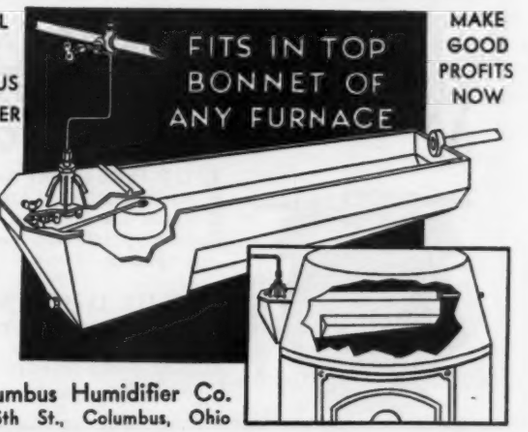
IN STOCK . . . READY FOR IMMEDIATE SHIPMENT

A. G. BRAUER SUPPLY CO.
312-18 NO. THIRD ST. . . . ST. LOUIS.

MODEL "C" COLUMBUS HUMIDIFIER

FITS IN TOP BONNET OF ANY FURNACE

MAKE GOOD PROFITS NOW



Dealers Write Today

The Columbus Humidifier Co.
154 N. 5th St., Columbus, Ohio

NEVER-SLIP *Conductor Hooks* **WITHSTAND USE and ABUSE**

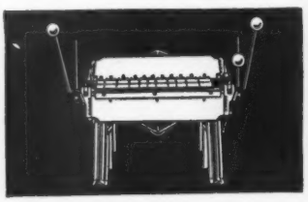
THE Never-Slip conductor Hook for wood is extra strong, being made of malleable iron, sherardized and can be driven in tight without fear of cracking off or breaking. The points on the hook will hold firmly to the corrugations on corrugated pipe and will also hold plain round pipe tight and without fear of loosening.
Write for literature and a sample of the Never-Slip conductor hook.

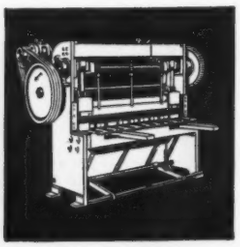
The NEVER-SLIP CONDUCTOR HOOK *for Wood*

ALSO MADE FOR BRICK

LA CROSSE STEEL ROOFING & CORRUGATING CO.
LA CROSSE WISCONSIN

CHICAGO





Box and Pan Brake Power Squaring Shear

STEEL BRAKES—PRESSES—SHEARS

DREIS & KRUMP MFG. CO.

7404 LOOMIS BLVD. CHICAGO

SEE at the Chicago Century of Progress, the Sunbeam Air Conditioning Unit equipped with a mechanical cooling unit in operation at the American Radiator & Standard Sanitary Corporation Building. See also the Sunbeam Air Conditioning System completely installed and in operation, at the Good Housekeeping—Stran-Steel Model House.

THE FOX FURNACE COMPANY, Elyria, Ohio

SUNBEAM

WARM AIR FURNACES AND AIR CONDITIONING UNITS

Install

ÆOLUS

Improved

VENTILATORS

FOR industrial buildings, schools, homes, theaters, etc. Made in 14 different metals. Constant ventilation—no noise—no upkeep.

ÆOLUS DICKINSON

Industrial Division of Paul Dickinson, Inc.

3332-52 South Artesian Avenue

Chicago, Ill.

"FABRIKATED"

COLD AIR FACES

Floor Registers

Forced Air Registers

82% OPEN AREA

ANY SIZE . . . ANY FINISH

May we send Catalogue?

INDEPENDENT

INDEPENDENT REGISTER & MFG. CO.

3741 East 93rd Street . . . Cleveland, Ohio

New Literature . . . .

Beer Comes Back

The fourth issue of the 1933 Inco magazine is devoted exclusively to the application of metal in the beer producing and selling field.

The booklet covers in detail the fabrication and application of monel metal to barrels, kegs, pitchers, steins, bars, trucks and beer production equipment.

A copy of the issue will be mailed to any contractor interested in beer dispensing equipment or the use of bright metals.

◆

Beverage Equipment

A beautifully illustrated catalog describing and showing the application of Allegheny metal to beer dispensing equipment, tavern equipment, restaurants, soda fountains, bars, service trays, work tables, etc., can be obtained by writing Allegheny Steel Company, Brackenridge, Pa.

◆

Insulation Booklet

The application of fibre board insulation to all types of commercial coolers, cooling rooms, storage rooms, etc., is discussed and illustrated in a new booklet published by the Armstrong Cork & Insulation Company, Lancaster, Pa. Copy of the booklet can be obtained from the company.

◆

Merchandising Campaign Booklets

The Perfection Stove Company, 7609 Platt Ave., Cleveland, Ohio, has published a series of four booklets covering the sales campaign and financing program developed by that company.

The first leaflet describes the deferred payment plan showing copies of application blanks and giving complete information on cost and operation of this plan.

A second booklet explains how to plan a selling program, shows copies of advertising and literature which will be furnished by the company to dealers for use in newspaper and direct mail work, contains copies of letters to prospects and customers and gives complete information on a suggested sales talk.

The third booklet is a 20-page compilation of sales points which can be used by the salesmen in the progress of a sale.

The fourth booklet is an elaborate presentation of operating data compiled in questionnaire form from users of the company's furnaces. Each questionnaire is accompanied by an illustration of the owner's house and is filled in to prove operating satisfaction, fuel costs and what the owner thinks of his heating plant.

The company will mail this material to any contractor interested in the sale of oil burning furnaces.

◆

Display Ideas

The Dennison Manufacturing Company, Framingham, Mass., announce the publication of a bulletin "Display Ideas from Dennison" to be published four times a year. The booklet describes practical window display ideas using paper.

The publication will be mailed to contractors upon application.

CLASSIFIED ADVERTISING

4 cents for each word including heading and address. Count seven words for keyed address. Minimum $1.00 for each insertion. One inch $3.00. Cash must accompany order. Copy should reach us eight days in advance of publication date.

SITUATIONS OPEN

DISTRIBUTORS WANTED—FOR HUmidifiers that are in demand, because of low prices. Get in now for quick profits. SUPERIOR HUMIDIFIER CO., 5820 Forsythe Street, Detroit, Michigan.

Salesman Wanted

Regularly calling on Furnace Dealers to sell a line of automatic damper and air conditioning controls for domestic installations, on a liberal commission basis. Old established manufacturer. Address Key 240, "American Artisan," 1900 Prairie Ave., Chicago, Ill.

EXPERIENCED TRAVELING SALESman wanted. Must be experienced in forced air and gravity heating. Address Key 243, "American Artisan," 1900 Prairie Ave., Chicago, Ill.

SITUATIONS WANTED

Situation Wanted

Furnace salesman and heating engineer of broad acquaintance and experience in the sale of all types of gravity, forced air, coal and gas fired and trunk-line systems, desires connection with progressive manufacturer. Will consider any territory. Thirty-nine years of age, married, a college education, served eight years as Ohio representative for one of the largest furnace manufacturers, unusual record of sales accomplishment, A-1 references. Address Key 244, "American Artisan," 1900 Prairie Ave., Chicago, Ill.

SITUATION WANTED—A FIRST CLASS tinner and plumber, steam and hot water fitter. Can do all kinds of repair work, radiator and pump repairing. Wants to rent or run shop on commission. Address Key 238, "American Artisan," 1900 Prairie Avenue, Chicago, Illinois.

SITUATION WANTED—HAVE HAD twenty-eight years' experience as tinner and plumber. Am qualified to do repairing and work in the following lines, auto radiator repairing, putting up steel ceilings, pump and windmill repairing, steam and hot water work, installing radios and any kind of mechanical job that comes into a shop. Can give good references. Address F. C. Blewett, Boscobel, Wisconsin.

WANTED, SITUATION: TRAVELING Chicago area. Sheet Metals and Metal products, or manufacturers' agent, or inside work. Wm. C. Allen, 566 Newton Ave., Glen Ellyn, Ill. Phone 528.

SITUATION WANTED BY A FIRST class sheet metal worker and warm air furnace man. I can make cornices, skylights, ventilation of all kinds. Especially good at job work: also a good roofer, slate, tile, tin and built-up roofing. Can do some plumbing. Can read blue prints and draft all kinds of patterns. I can also furnish references. Edward Collins, 82 Currier St., N. E., Atlanta, Georgia.

SITUATION WANTED—SHEET METAL worker first class, twenty years' experience, A No. 1 lay-out man and estimator. Am a registered plumber and first class lead worker, fully experienced in all heating, large and small jobs as well. I was foreman on three government jobs, factory trained in Oxy-Acetylene welding, best of references. Will take a shop on percentage. Good salesman, honest, sober. Will go anywhere, prefer the east. Address Key 235, "American Artisan," 1900 Prairie Avenue, Chicago, Illinois.

WOULD LIKE TO CONNECT WITH someone who does blow pipe work around a glass house that manufactures bottles. I am an experienced man in that line and also the other sheet metal work and outside work. Will go anywhere. Address Key 227, "American Artisan," 1900 Prairie Ave., Chicago, Ill.

ALL AROUND SHEET METAL WORKER and heating expert and plumber, sober, steady and reliable, wants position. Will go anywhere and can do any job. Reasonable wages. Address Key 226, "American Artisan," 1900 Prairie Ave., Chicago, Ill.

TRAINED AND EXPERIENCED MEchanic wishes position in first class sheet metal shop. Can design, lay-out, build and erect most any sheet metal, hard shingle and tile roofing job that comes along. Especially experienced in cornice, skylight, window and door work, gutters, ventilating, etc., on churches, schools, residences, etc., in metals as iron, copper, aluminum, zinc, stainless steels, etc. Will gladly furnish references upon request. Address Key 232, "American Artisan," 1900 Prairie Avenue, Chicago, Illinois

FIRST CLASS, THOROUGHLY EXPErienced, practical roofing and sheet metal estimator desires connection with a substantial concern. Address Key 230, "American Artisan," 1900 Prairie Avenue, Chicago, Illinois.

WANTED: POSITION AS TINNER AND plumber. Have state license. An expert hot air furnace worker; also back bar and brewery work. Steady, sober, good habits. Good references. Address Key 229, "American Artisan," 1900 Prairie Ave., Chicago, Ill.

WANTED TO BUY

WANTED—BY FIRST CLASS MASTER plumber and steamfitter, can also do sheet metal work, a shop to run on commission basis or a Service-at-your-Door Truck. Will furnish truck and set of tools where town and conditions will warrant it. Must be in Illinois. Address Key 234, "American Artisan," 1900 Prairie Avenue, Chicago, Illinois.

WANTED—A TEN FOOT CORNICE Brake. Must be in good condition. J. V. Patten Company, Sycamore, Illinois.

WANTED: A MAPLEWOOD ELBOW machine. The Baker Furnace & Cleaner Mfg. Co., 2505 Albion St., Toledo, Ohio.

FOR SALE

FOR SALE—FURNACE CLEANER IN good condition. ¾ H. P. Universal Electric Motor. Also expanding chimney cleaner. Address Key 245. "American Artisan," 1900 Prairie Avenue, Chicago.

FOR SALE—ONE COMPLETE SET OF tinner's tools and stock, with or without shop. Residence and garage. Business has been established eleven years. Address Key 236, "American Artisan," 1900 Prairie Avenue, Chicago, Illinois.

MISCELLANEOUS

Patents and Trade Marks
Philip V. W. Peck
Barrister Bldg., Washington, D. C.

MAILING LISTS

Pave the way to more sales with actual names and addresses of Live prospects.

Get them from the original compilers of basic list information—up to date—accurate—guaranteed.

Tell us about your business. We'll help you find the prospects. No obligation for consultation service.

60 page Reference Book and Mailing LIST CATALOG

Gives counts and prices on 8,000 lines of business. Shows you how to get special lists by territories and line of business. Auto lists of all kinds. Shows you how to use the mails to sell your products and services. Write today.

R. L. POLK & CO.
Polk Bldg.—Detroit, Mich.
Branches in Principal Cities
World's Largest City Directory Publishers

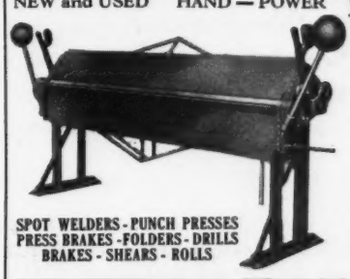
Mailing List Compilers. Business Statistics. Producers of Direct Mail Advertising.

SHEET METAL MACHINERY

NEW and USED HAND — POWER

PRICED to SELL—READY to SHIP
Draw on the MOST COMPLETE STOCK IN AMERICA

- - Rebuilt Bargains - -



SPOT WELDERS - PUNCH PRESSES
PRESS BRAKES - FOLDERS - DRILLS
BRAKES - SHEARS - ROLLS

Brakes Chgo. Steel 3'16; 5'18; 6'14; 8'14; 8'16; 8'18; 10'18; 10'16; 10'14 ga.
50—Power Shears—all sizes.
Ring and Circle Shears
Nia. No. 15, 16 and 17:
Chgo. Elbow Mach...$125.00
42x3½ B.G. Slip Roll 95.00
Bar Folder, 30"..... 25.00
30" Pipe Folder..... 10.00
Whitney Angle Shear 17.50
Clough Dp. Thr. Punch 62.50
New ¼" Steel Slitter 30.00
Imperial Acetylene Welding Outfit
No. 8 Marvel Band Saw Motor Drive.
5'14 ga. Hand Roll...$ 85.00
50" ¾" Beloit Power Bending Roll.
8' Chicago Steel Press Brake Motor Drive.
10' Bertsch 10 ga. Power Roll.
8' 18 ga. Foot Shear 150.00
Stakes all types and sizes.

"OVER 1500 OTHERS TO CHOOSE FROM"

INTERSTATE MACHINERY COMPANY
130 S. Clinton St. - - - - - Chicago

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For Complete Lists of Furnace, Sheet Metal and Air Conditioning Products and Sources of Supply Consult AMERICAN ARTISAN ANNUAL DIRECTORY NUMBER

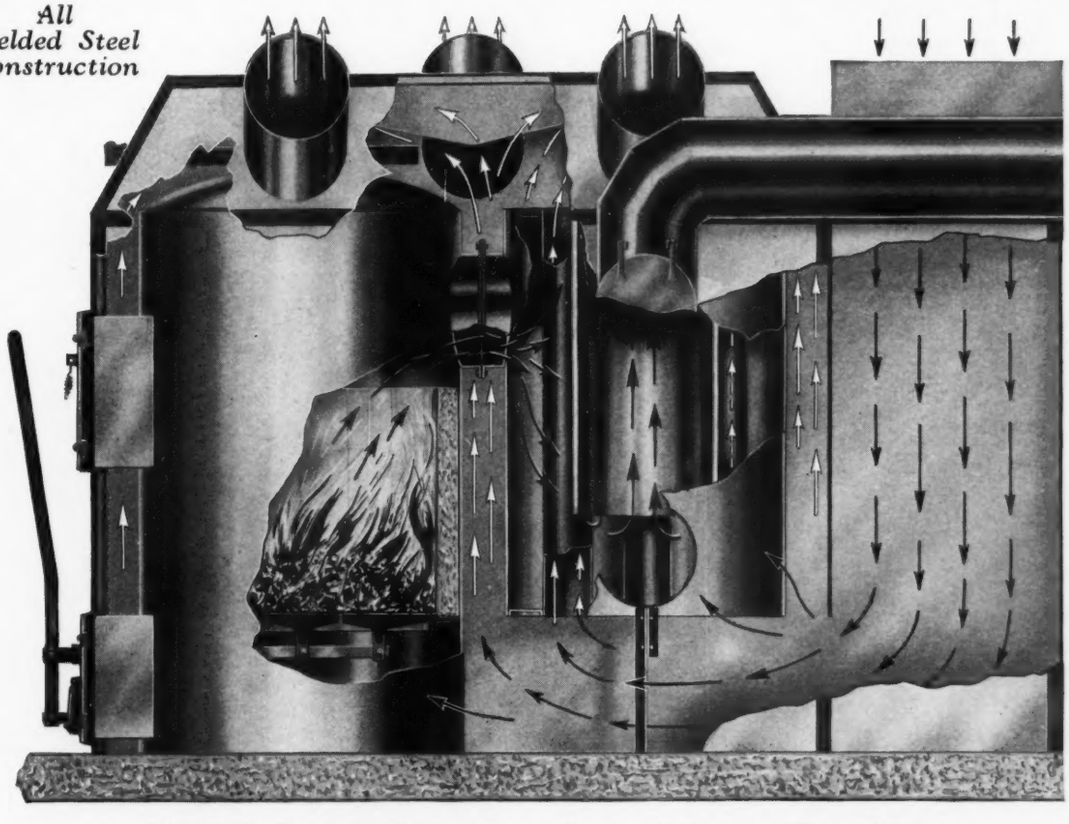
MR. DEALER » »

HERE IS YOUR OPPORTUNITY TO MAKE A REAL PROFIT!

SELL THE

BRUNETT "Dual" Warm Air Heating System

All Welded Steel Construction



The Only Furnace Made with a Patented Brunett Heat Utilizer

THE BRUNETT "Dual" Warm Air Heating System is built for the largest as well as for the smallest job. It will make sales for you and increase your heating business. It's an opportunity to get in on the "GROUND FLOOR," of a new heating field—and make some real money.

You can also sell the Patented Heat Utilizer separately for jobs where there is a huge heat loss. It will save your customer 25 to 60% of his fuel bill.

DEALER PROPOSITION: The Plan which you can make allows you to make an attractive profit.

WRITE TODAY FOR INFORMATION

BROWN SHEET IRON & STEEL COMPANY

Pioneer Welders of the Northwest

BUILDERS OF THE WORLD'S LARGEST ONE UNIT WARM AIR FURNACES

964 BERRY AVENUE **SAINT PAUL, MINNESOTA**

MILCOR

SELFLOCK

STOVE PIPE

DIFFERENT FROM EVERY OTHER STOVE PIPE

Note the design of this new Selflock Stove Pipe as shown in the profiles. May be assembled simply by inserting the fold on one edge into the fold on the other and then pressing with the hands. The lock remains tight and absolutely will not slip. Pipe may be cut at any point and still retain locking features on all sections.

A Better Lock Was Never Made

Seam On Inside

Mechanically Correct

KUEHN'S FRICTIONLESS TEE-JOINT (LEFT)

Frictionless construction permits an equal draft in each pipe. No current of air will flow properly around a right angle corner. This Tee-Joint eliminates right angle corners entirely.

MILCOR CORRUGATED STOVE PIPE ELBOW (RIGHT)

Milcor Stove Pipe Elbows are riveted top and bottom. Modern equipment insures uniformity of workmanship.

MILCOR PRODUCTS

MILWAUKEE, WIS. **MILCOR STEEL COMPANY** CANTON, OHIO

CHICAGO, ILLINOIS KANSAS CITY, MISSOURI LA CROSSE, WISCONSIN